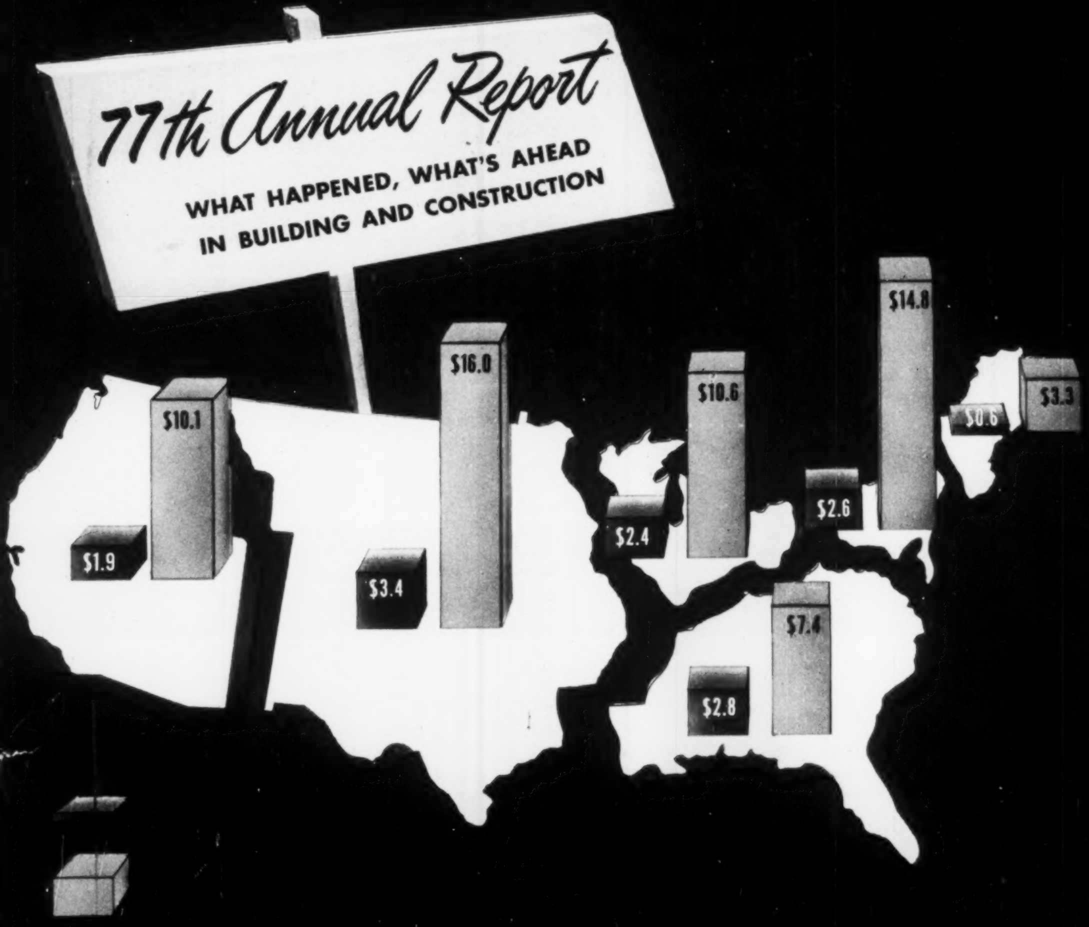
ENGINEERING NEWS-RECORD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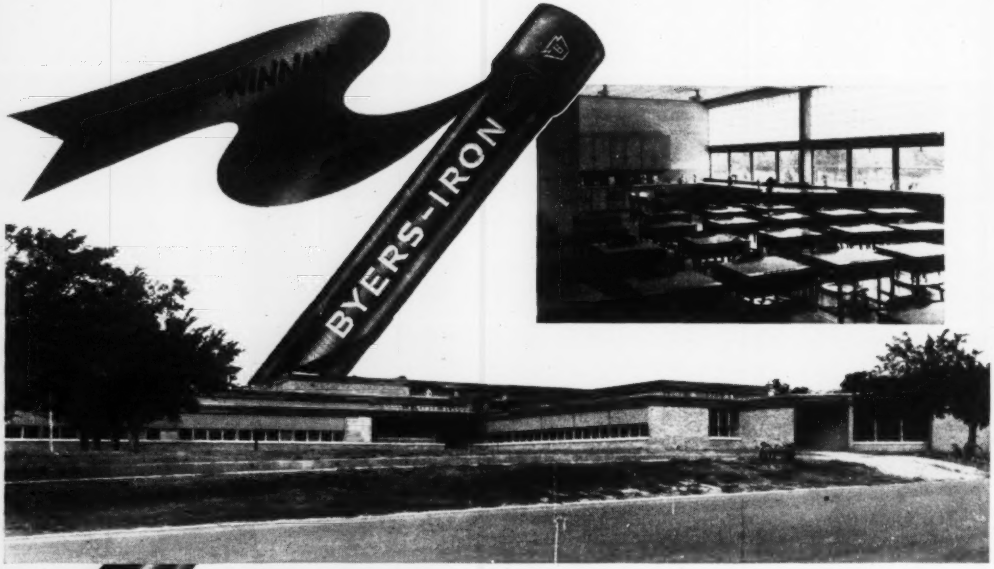

BYERS WROUGHT IRON PIPE

safeguards the radiant heating system and 6 other services

Selected by the American Association of School Administrators as one of the best modern rural school designs, the Lincoln Grade and Junior High School, Lincoln, Kansas, represents an outstanding example of functional architecture and material selection.

Arranged to serve community and students with equal comfort and efficiency, the $320,000 structure features a radiant heating system augmented by a duct system that introduces tempered fresh air into the classrooms. In addition to the over-all comfort provided by the system, the lower-aged children playing on the floor are protected from hazardous drafts. To assure permanence and freedom from maintenance, the designers specified genuine wrought iron for the radiant heating coils. This time-tested material was also used for steam and return lines, blow-down and gas lines, vents and downspouts. Shaver and Shaver were the architects; Ryan Engineering Company, the consulting engineers.

Byers Wrought Iron pipe has rolled up impressive service records in all these services. And because it has demonstrated its ability to serve longer, it is the first choice of experienced engineers everywhere.

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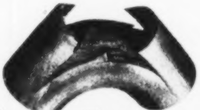

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Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective sacle, which shields the underlying metal.

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He recommended installing a length of a specially built Goodyear hose—called "Diversipipe"—as a flexible link between the land section and bridge section of the water main. This 15-foot hose, made with built-in nipples, replaced a 10-foot section of metal pipe—allowing for the take-up in raising the bridge and providing uninterrupted service all during the move. Total cost of the job was far below every other possible answer to the problem.

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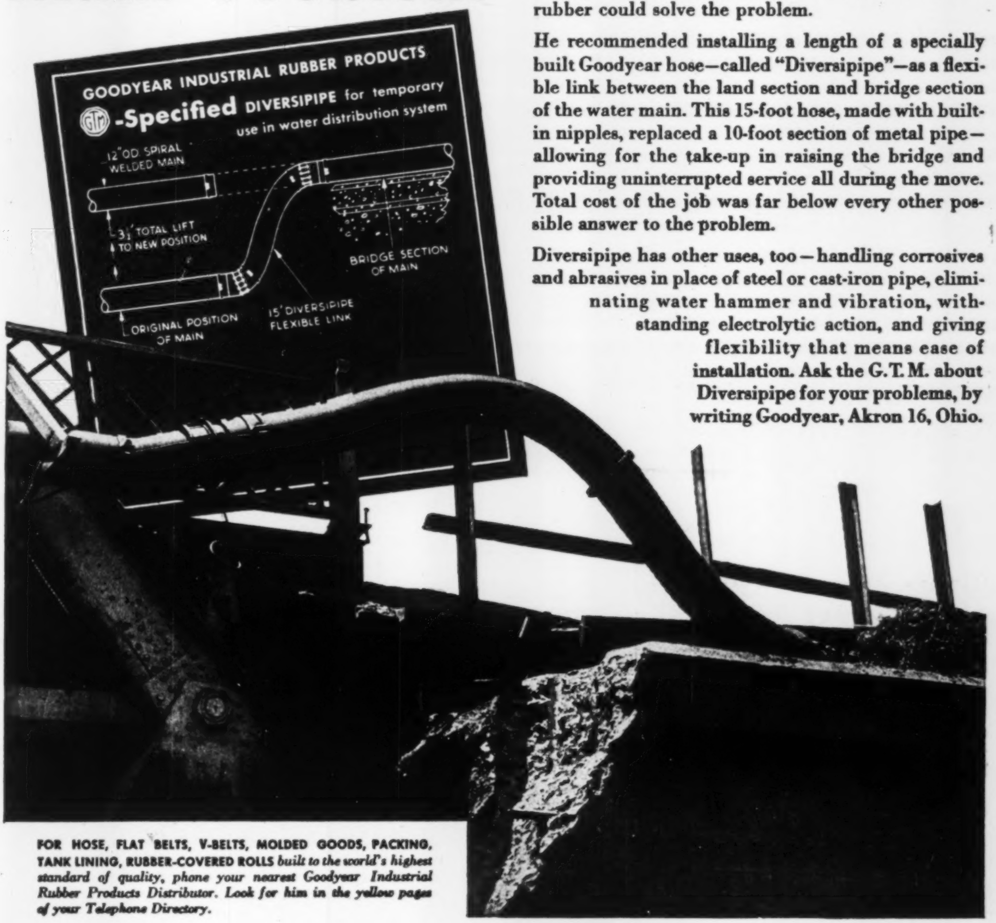
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ENGINEERING NEWS-RECORD

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VOLUME 148 FEBRUARY 14, 1952 No. 7

WALDO G. BOWMAN
Editor

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Construction Business Outlook 53

How will construction fare, business-wise, in the coming year? How does it stand for materials, men, money, machines? Here are 11 pages of answers.

Where Construction Money Comes From 63

There's more money available for construction now than ever before. Here are some of the sources of it, the reasons why it costs more to use.

Raising Our Capacity to Produce 68

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Number of copies of this issue printed 51,096

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Domestic News Bureaus—Atlanta, Chicago, Cleveland, Detroit, Houston, Los Angeles, San Francisco, Washington. Correspondents in 71 cities in the United States, Canada and Mexico.

Foreign News Bureaus—London, Frankfurt, Paris, Moscow, Tokyo, Bombay, Melbourne, Rio de Janeiro, Mexico City. *Correspondents*—Athens, Rome, Caracas, Buenos Aires, Santiago, Shanghai, Zurich, Johannesburg and 40 other cities.

ROBERT F. BOGER
Publisher

February 14, 1952 **ENGINEERING NEWS-RECORD** **Vol. 148—No. 7**
Member ABC and ABP

Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office, 99-129 North Broadway, Albany 1, N. Y.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Engineering News-Record—Subscription Service, 99-129 N. Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 36, N. Y. Allow ten days for change of address.

Please indicate position and company connection on all subscription orders.

Single copies 35¢. This issue $2.00. Subscription rates—United States and possessions, $6.00 a year; $9.00 for two years; $12.00 for three years. Canada, $8.00 a year; $12.00 for two years; $16.00 for three years. Pan American countries, $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries, $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter October 29, 1936, at the Post Office at Albany, N. Y., under Act of Mar. 3, 1879. Printed in U. S. A.
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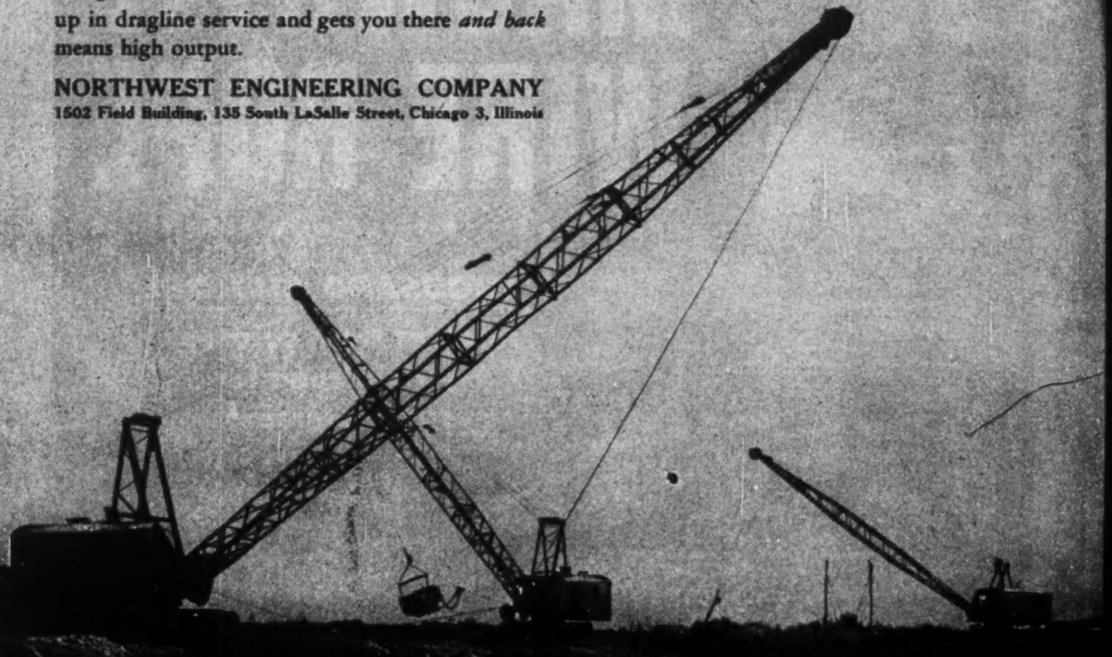

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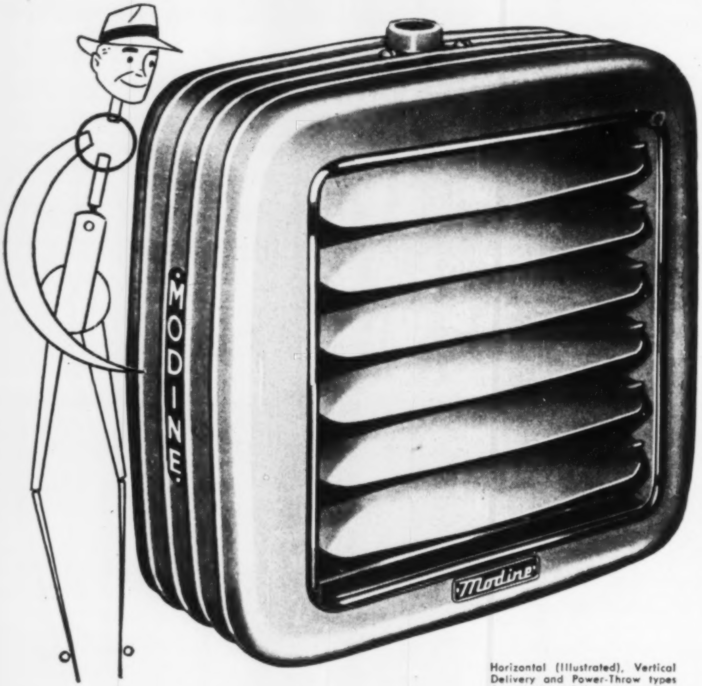

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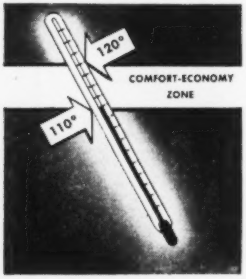

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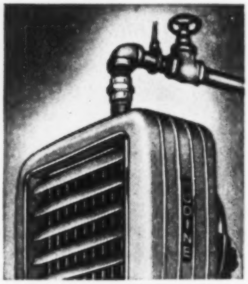

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Write for Bulletin 149-A, "Modine Unit Heating." Or contact your Modine representative listed in your classified phone book.

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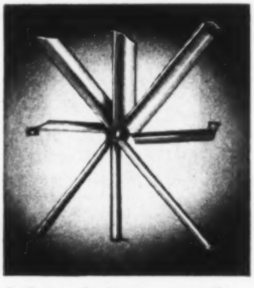

Built-in velocity generator effectively steps up heat throw. This assures positive heat penetration of cold air strata near the floor.

U-1133

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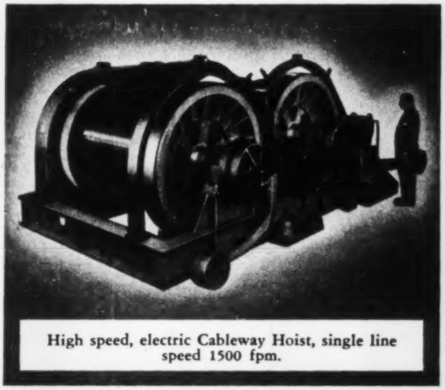
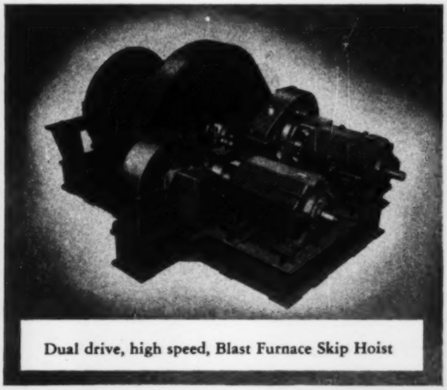
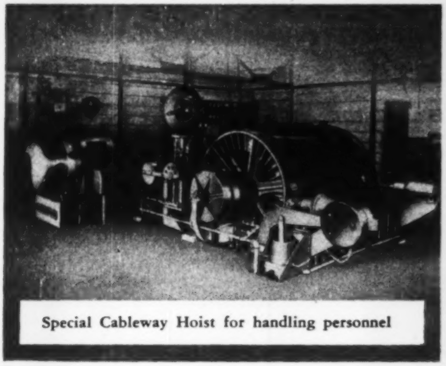


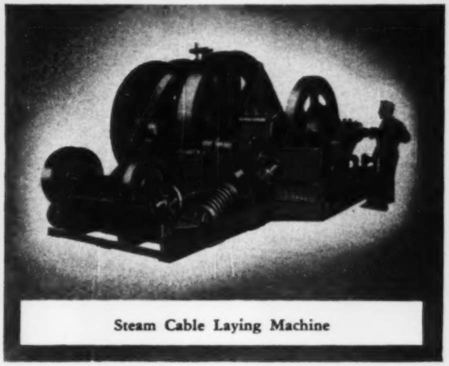
High speed, electric Cableway Hoist, single line speed 1500 fpm.



Dual drive, high speed, Blast Furnace Skip Hoist



Special Cableway Hoist for handling personnel



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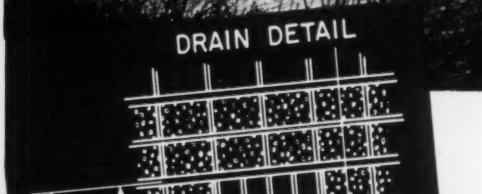
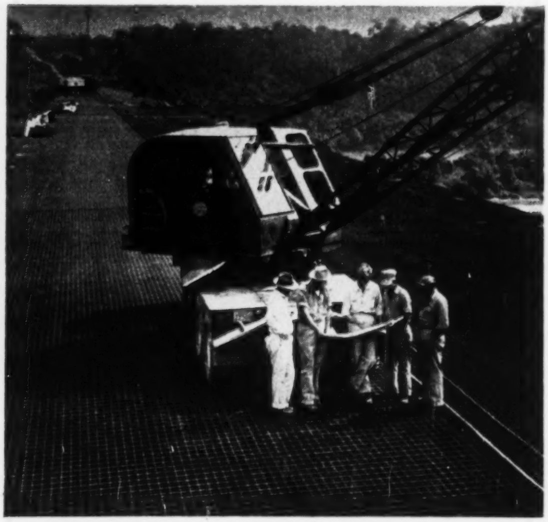
LIDGERWOOD

7 DEY STREET, NEW YORK 7, N. Y.

Recently opened to traffic, *this four-lane bridge carries the new Western Extension of the Pennsylvania Turnpike over the Allegheny River. It is floored with concrete-filled U·S·S I-Beam-Lok Steel Flooring. The bridge was fabricated and erected by the American Bridge Division of United States Steel Company; concrete was applied by Booth & Flinn, Pittsburgh; designers of the bridge were Modjeski & Masters, Consulting Engineers, Harrisburg, Pennsylvania.*

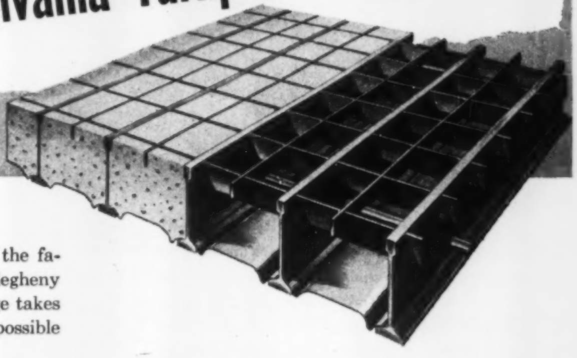

DRAIN DETAIL
I-BEAM DRAIN 1'-0"
2'-0" OPEN
1'-0"
8" OPEN
CURB LINE
APPROX. 2"

This photograph shows *the U·S·S I-Beam-Lok flooring of the Turnpike bridge before concrete was applied.*



Nearly 4 million pounds of floor deadweight saved

by using concrete-filled U·S·S I-Beam-Lok on new Pennsylvania Turnpike bridge



CARRYING the new Western Extension of the famous Pennsylvania Turnpike over the Allegheny River at Oakmont, this wide, four-lane bridge takes full advantage of the weight savings made possible by U·S·S I-Beam-Lok Steel Flooring.

The bridge consists of five truss spans, arranged in a continuous cantilever pattern, and four girder spans in the north approach. Its 2,179-foot roadway contains 131,669 square feet of 4¼-inch I-Beam-Lok. Concreted with ¾-inch overfill, it provides a five-inch roadway.

This 4¼-inch concrete-filled I-Beam-Lok with ¾-inch overfill weighs only 66.5 pounds per square foot. Had eight-inch reinforced concrete floor been used, the weight per square foot would have been 96 pounds. Thus, on the total area of the floor, I-Beam-Lok saved a total of 3,884,235 pounds. And, in addition, important savings in weight and cost were realized in the foundations and supporting members because of the use of this lighter weight floor.

U·S·S I-Beam-Lok also played an important role in the drainage system of the bridge. Unconcreted openings, two feet long and eight inches wide, were left at intervals along the outside of the two 26-foot roadways.

This "modern floor for modern traffic" combines light weight and reduced costs with roadway rigidity, ease of erection, a smooth, hard surface and low maintenance costs. It is available in both concrete-filled and open types. Our engineers will be glad to discuss its possibilities with you.

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U·S·S I-BEAM-LOK

USS

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WITH DETACHABLE, REUSABLE FITTINGS

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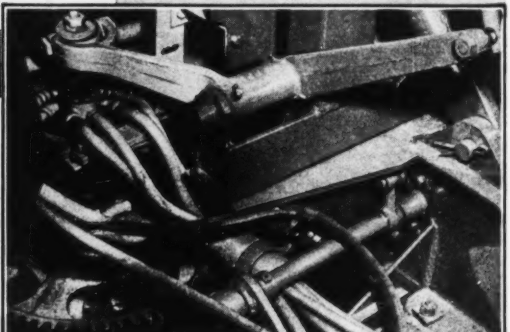
ON EARTHMOVING EQUIPMENT



Here Aeroquip Flexible Hose Assemblies are used in the hydraulic system of a wheel-mounted shovel crane. Wire braid reinforced, these heavy-duty hose assemblies match the ruggedness of hardworking earthmoving equipment of all types.

Save time, save money and reduce inventory by putting the "Aeroquip Idea" to work for you. With Aeroquip you make your own flexible hose assemblies by cutting bulk hose to desired lengths and attaching Aeroquip Reusable Fittings. Assembly can be accomplished quickly and easily right on the job. No special tools are required. No training is needed. Aeroquip high quality Flexible Hose Lines improve performance and reduce maintenance. They eliminate leaks due to vibration and operate dependably at extremely high or low temperatures. They are widely used for hydraulic fluid, water, air, lubricating oils, gas and Diesel fuels and many other fluids.

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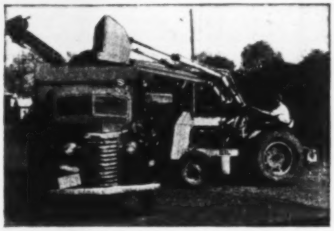

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Note how the Long Forward Reach of the Lull Shoveloader lets you get in close, handles big loads with ease, and permits minimum maneuvering.

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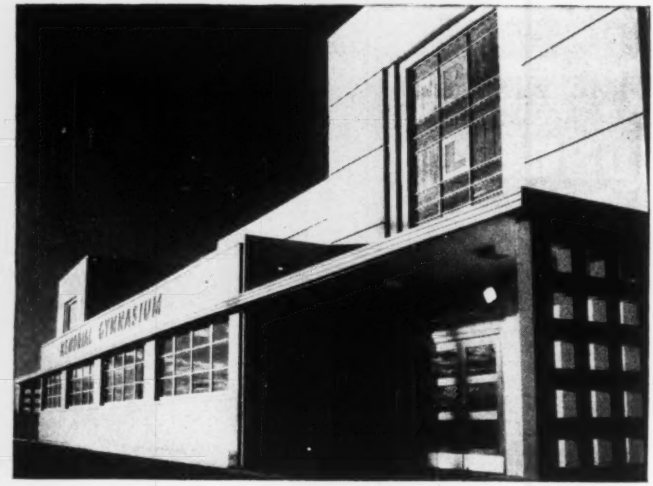

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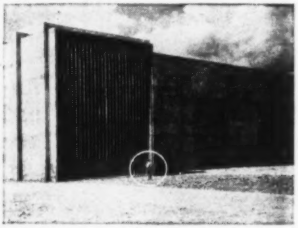


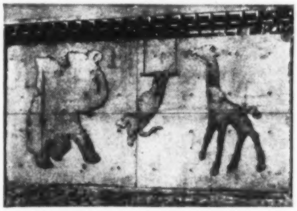
Douglas fir plywood helped speed form-work time by 15 per cent in building the giant reinforced concrete wind tunnel silencer at the Lewis Flight Propulsion Laboratory of the National Committee on Aeronautics at Cleveland, Ohio.

"It was a hurry-up contract with a penalty clause," explains H. F. Hadde, chief engineer for the Hunkin-Conky Construction Company, Cleveland, project contractors. "Plywood forms helped get the job done fast and also formed the smooth concrete required in the design of the structure."

Smooth concrete was a must on the inner walls because roughness would cause a drop in air pressure, requiring more power to pass air through the system of ducts and baffles which curb noise and pressure waves generated by "hot" ram-jet engine tests. Plywood forms were used on outer walls for appearance.

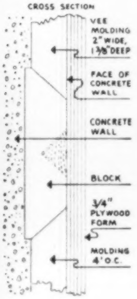
Forms were built by placing standard 4'x8' plywood sheets across 2"x6" studs, backed by 2"x6" walers. After each pour, forms were stripped, re-oiled and crane-erected into position for the next pour. The new acoustical house which is an addition to an existing supersonic wind tunnel is 50 feet high, 33 feet wide and 190 feet long.

Concrete Intaglio Cast With Plywood



Plywood cut-outs, nailed to the plywood form face, were used to create these whimsical nursery figures on the exterior concrete wall of the kindergarten play yard at the Whitman School, Tacoma, Wash. Architect John G. Richards of Lea, Pearson and Richards developed the idea. Over 7' high, the figures were formed using ⅜" plywood cut-outs, secured to ⅝" form panels. On the soon-to-be-completed project, plywood forms are being re-used as roof decking. Contractors: Standard Construction Company, Tacoma, Washington.

Concrete Wall Cast In Novel Block Pattern

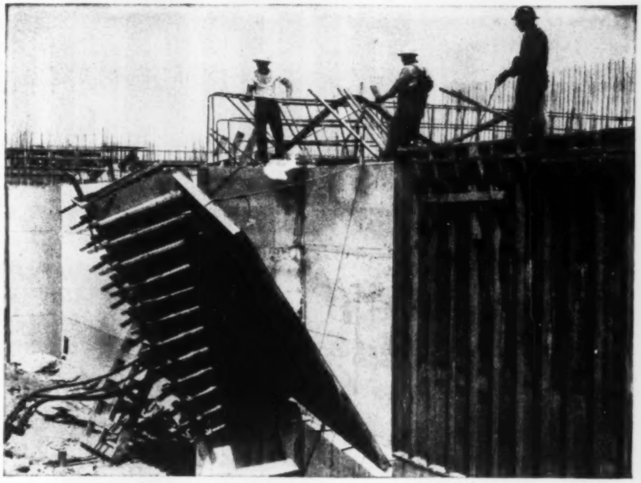


Windowless concrete walls cast in block pattern, painted a cheerful old rose distinguish the Tarlow Furniture Store, Portland, Ore. The structure is from the design board of Richard Sundeleaf of Portland and was built by the George H. Buckler contracting firm with A. L. Funk, general superintendent. Plywood forms were specified to assure that the desired effect would be achieved.

The novel block pattern was formed by nailing vee-moldings, 2″-wide, 1$\frac{3}{8}$″-deep to the plywood form face. To create additional interest with varying shadow lines, the inset diamond-shaped blocks are slightly deeper than the moldings as shown in the accompanying detail.

Plywood Forms Shape Modern Church

Because they offer the simplest method of obtaining the smooth, curved walls, Architect Paul Thiry specified plywood form panels for all concrete work on the Church of Christ the King, Seattle, Wash. Built by the Austin Co., Seattle, the curved walls were formed by nailing 4′x8′ sheets, $\frac{5}{8}$″-thick, horizontally across double 2″x12″ walers, bandsawed to the desired radius. In no place were the 2x12s sawn to less than 3 inches. The walers were backed by 2″x4″ studding. One-quarter inch thick plywood was used to form the concrete band above and below the windows. Entrance canopy and tall tower were also formed against $\frac{5}{8}$″ plywood with conventional framing.



When Re-Use Counts– Specify Plywood Forms

MEASURED in terms of cost per use, Douglas fir plywood ranks as one of the most economical of all form materials. On apartments, office or factory buildings, plywood form sections can be used to job completion—eliminating the problem of form reconstruction once the job is under way. Plywood deserves ordinary care in handling, but it does *not* require extreme caution at every step and is far more rugged than other panel type materials. The exact number of re-uses obtained vary with grade and the care it receives on the job. Builders report up to 10 or 15 re-uses with PlyForm (see grade data below) panels . . . *twice* as many with Exterior-type and plastic faced plywoods.

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- **Plywood is strong, rigid—yet light, easy to handle**
- **Plywood forms are puncture-proof, water and mortar tight**
- **Plywood has superior nail and tie holding properties**
- **Plywood is easy to work with hand or power tools**
- **Plywood provides sheathing and lining in one material**

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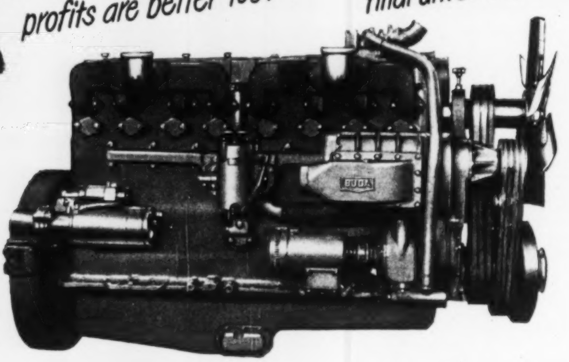

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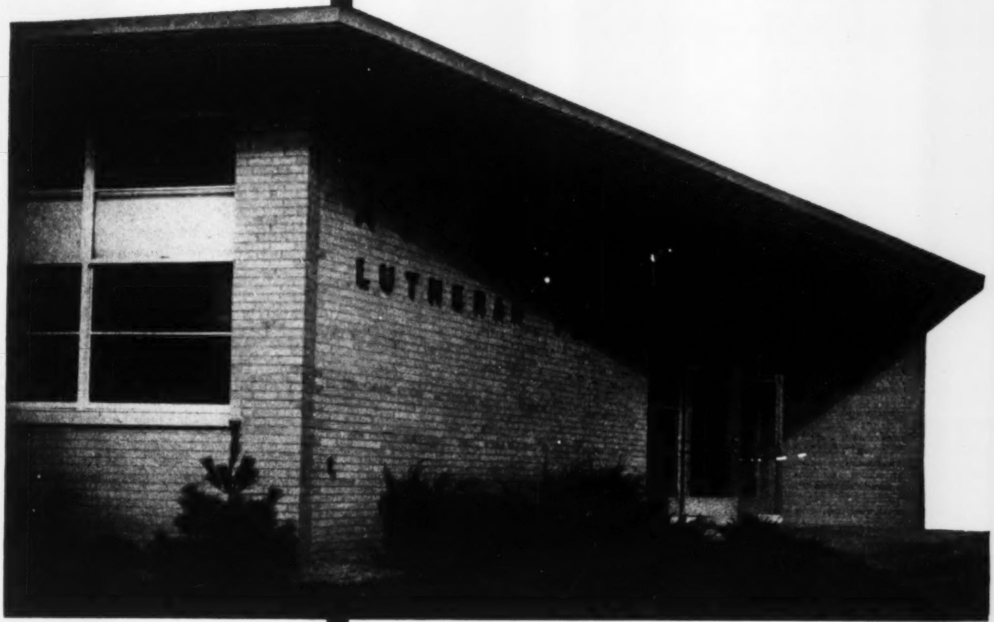

Ascension Lutheran School. Architect: Kenneth E. Wischmeyer (formerly Wischmeyer & Lorenz), St. Louis. Contractor: George Moeller Construction Company, St. Louis. Wood Treater: Associated Wood Preservers, St. Louis. Lumber: Hill-Behan Lumber Company, St. Louis.

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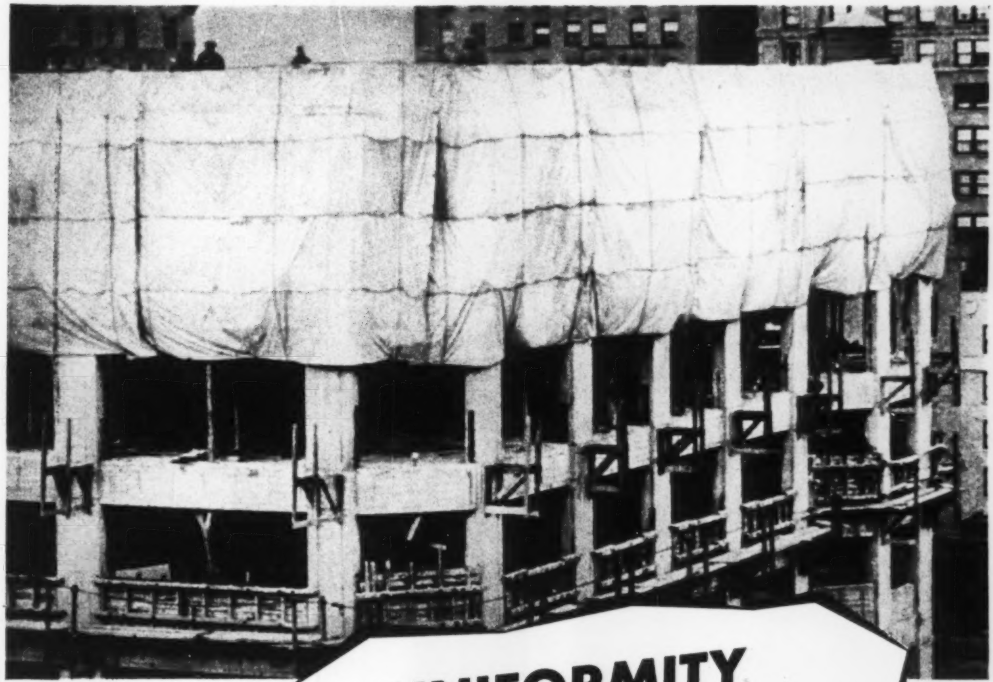

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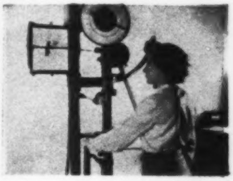

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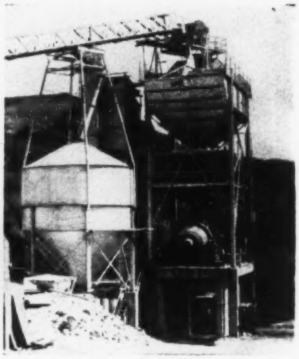

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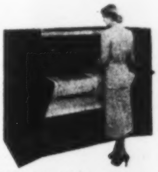

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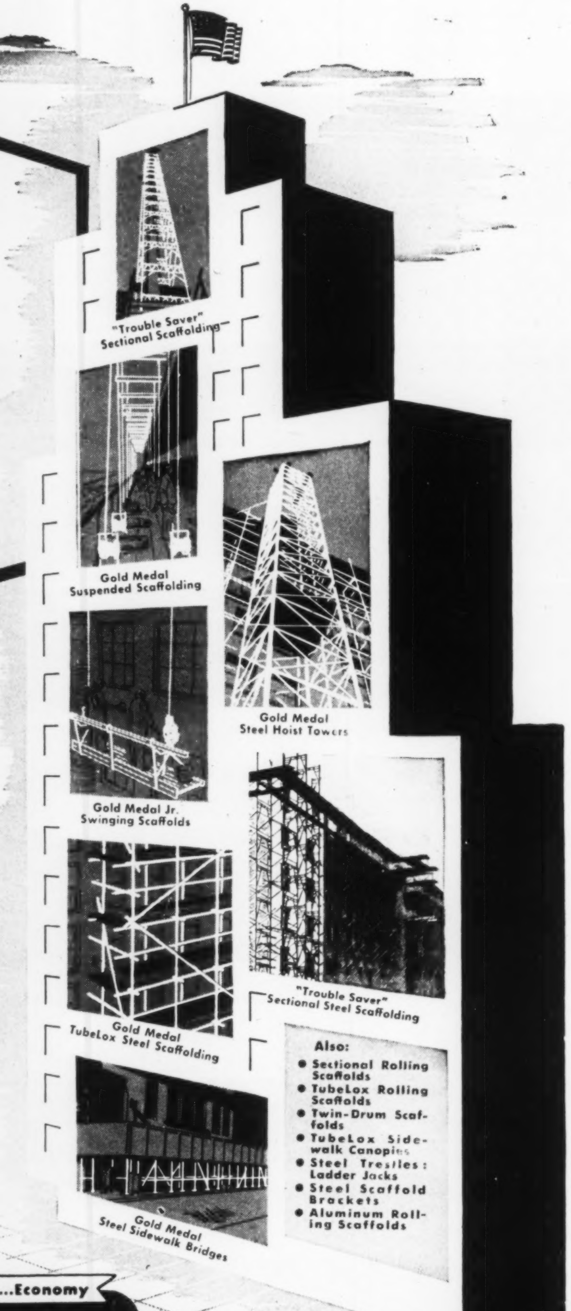
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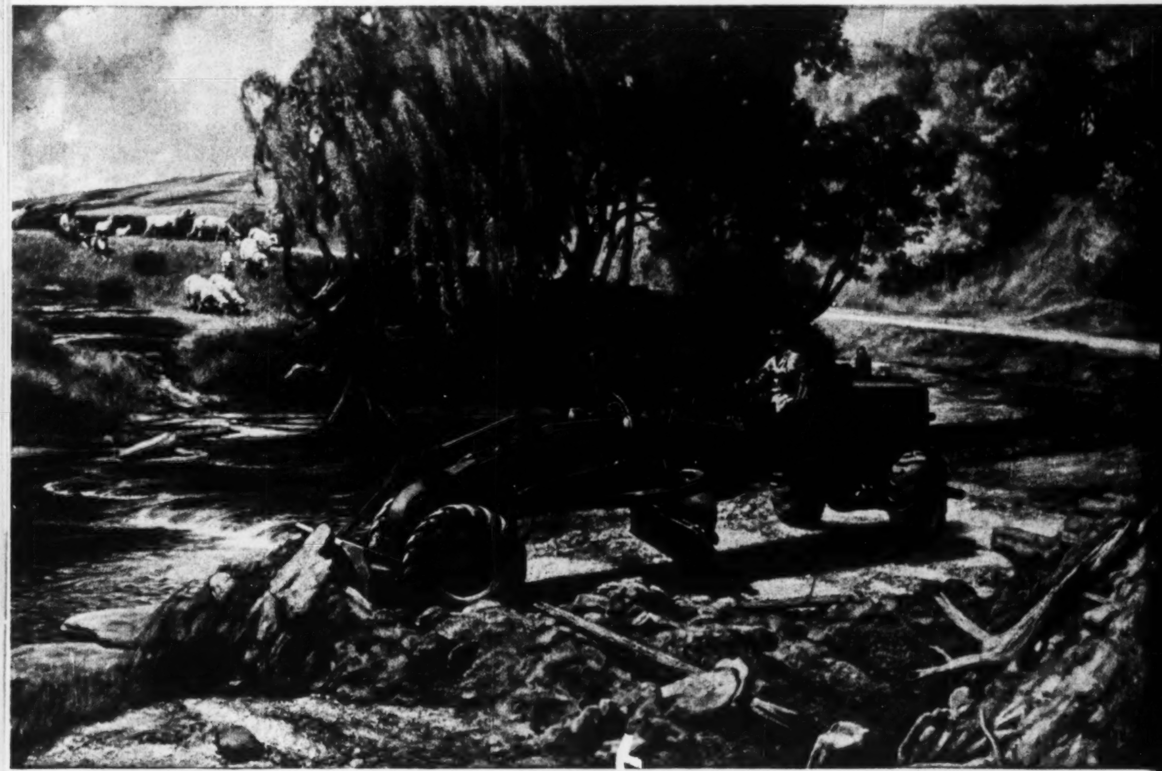

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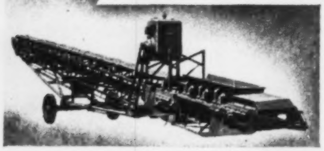

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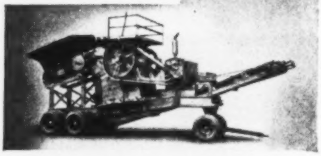

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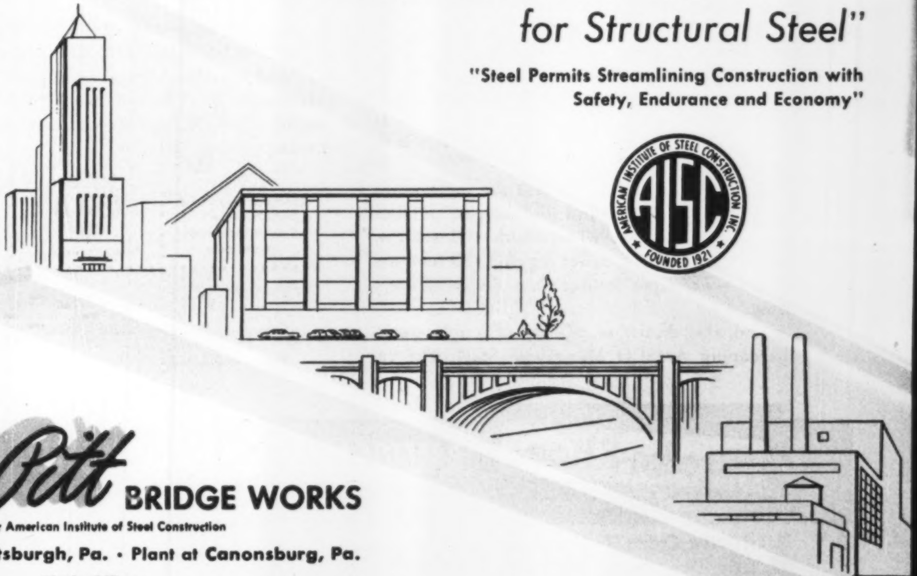

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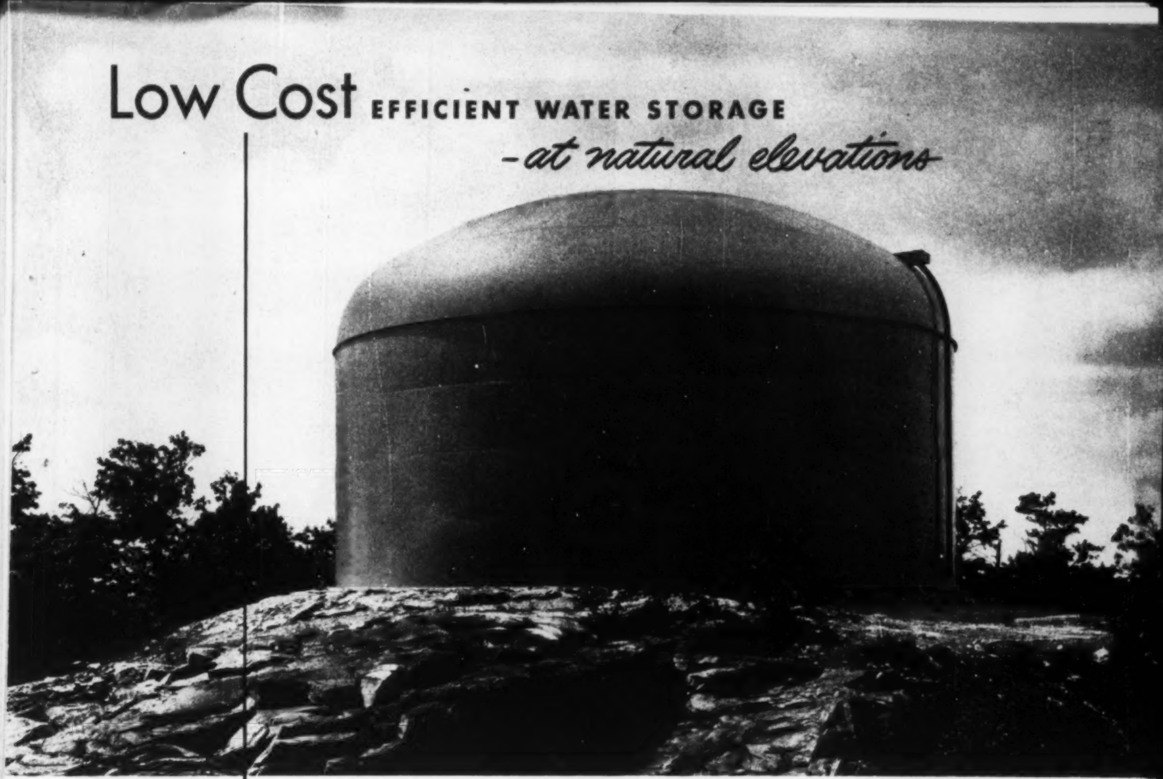

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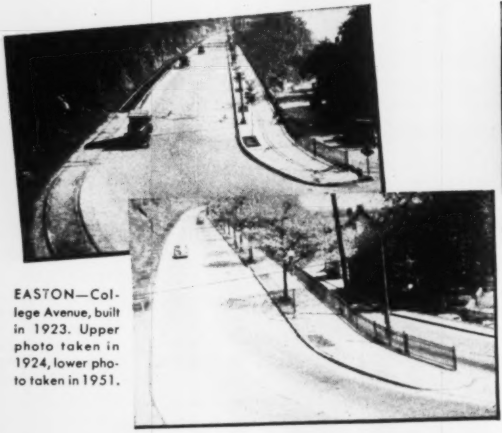
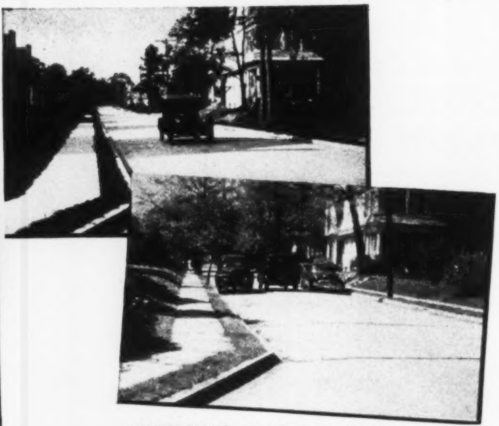


EASTON—College Avenue, built in 1923. Upper photo taken in 1924, lower photo taken in 1951.



LANDSDOWNE—Crawford Ave., built in 1923. Photos taken in 1924 and 1951.

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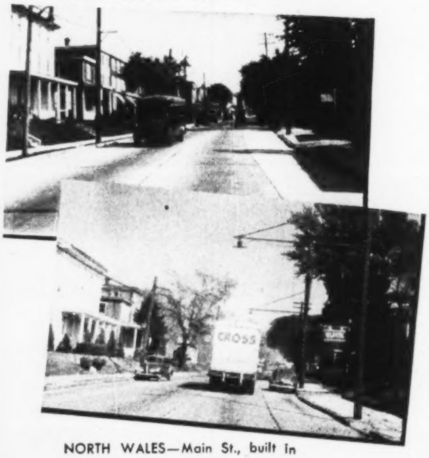
UPPER DARBY—Garrett Rd., built in 1924. Photos taken 1924 and 1951.

LEBANON (at left)—Seventh Street was built in 1926. Upper photo was taken in 1927. Lower photo was taken in 1951.



NORTH WALES—Main St., built in 1926. Photos taken 1927 and 1951.

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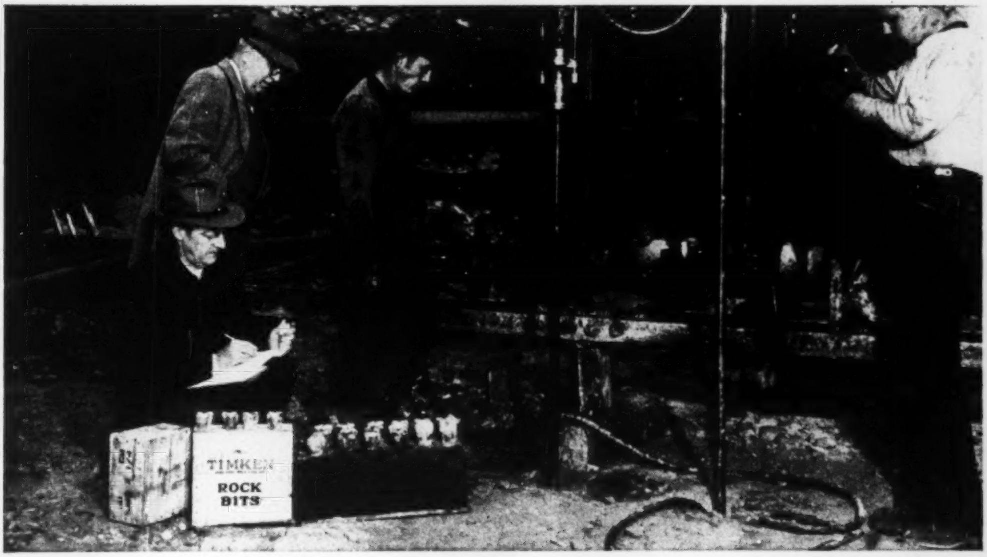

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This is one of 6 units used by Tomlinson Construction Co., Ltd. with such success on various projects in U. S. and Canada.

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Bulletin RM-50008 shows why you can bank on a Heiliner to help you meet schedules and avoid penalties. Write for your copy

4-Wheel Brakes!

Heavy-duty two-shoe air brakes. Auxiliary hand controls provided also.

Good Visibility!

No obstructions block operator's vision ahead or behind. He can always see how he's doing.

Comfortable Seat!

Reduces operator fatigue, by absorbing the shocks in rough going.

Easy-to-Service Gears!

Final planetary drive reduction gears can be serviced without removing wheels or disturbing brakes or hub bearings.

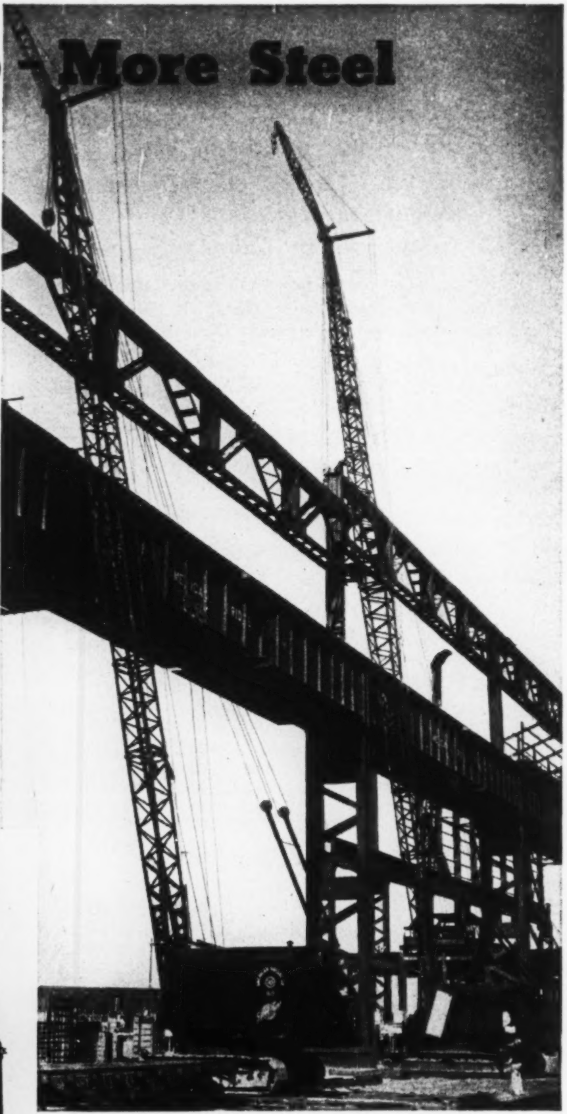
Coming Up—More Steel

23 Manitowocs Speed Construction at U. S. Steel Fairless Works

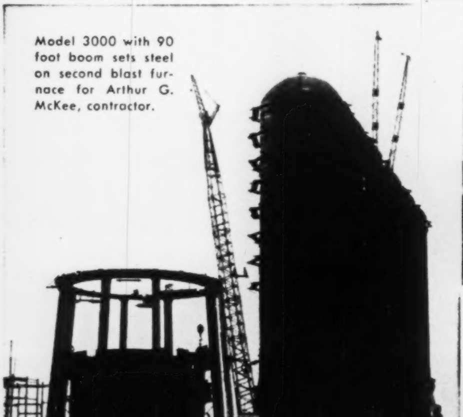
On this huge Pennsylvania project 23 Manitowoc Cranes and Draglines, more than any other make, are carrying the brunt of the work excavating and steel erecting for the major contractors.

Such preference means only one thing, satisfactory performance—ability to handle heavy loads, high up with pin point precision and utmost safety.

And on most other major projects whether it be earth excavation or steel erection you'll find those big, husky Manitowocs handling the toughest parts of the job. They'll handle *your* job too. Manitowoc Engineering Works, Manitowoc, Wisconsin.



American Bridge uses a Model 3500 and a Model 3900 Speedcrane to set a heavy girder for the Open Hearth building. Reach plus stability means speed and safety.



Model 3000 with 90 foot boom sets steel on second blast furnace for Arthur G. McKee, contractor.

MANITOWOC

SHOVELS
1-5 YD.

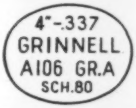
Speedcrane

CRANES
18-100 TON

For easier, better welding . . .

GRINNELL WELDING FITTINGS

A qualified welder can make welds quickly and easily with Grinnell Welding Fittings. These fittings are made by a hydraulic forging process that assures uniform wall thickness at all points and true circularity throughout. Of seamless, one-piece construction, they can be cut at any angle to match up with standard weight, and extra strong and heavier wall pipe in I.D. or O.D. sizes. Pressure-temperature ratings are equal to or greater than those of seamless steel pipe. Grinnell Welding Fittings are process stress-relieved.

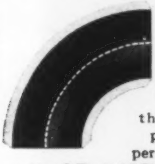


Permanent Identification

Each Welding Fitting bears a metal plate giving size, wall thickness, material and name for easy, positive identification.

Full Length Outlets

Full length outlets permit fast lining up and ample room for rod manipulation; keep high welding heat away from vital crotch zones.



Uniform Wall Thickness

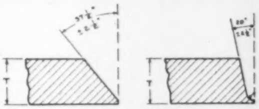
Uniform wall thickness at all points permits perfect lineup with pipe, O.D. and I.D. No thinning of long outer wall . . . no thickening of short inner wall. Complies with code requirements.

True Circular Section

True circular section at all points makes fitting easy to align and weld . . . no distortion or flattening to affect flow adversely.

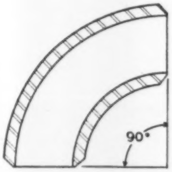
Plain Circumferential Butt Welds

Grinnell Welding Fittings confine all welds to plain circumferential butt welds — with their inherent strength and simplicity.



Accurate Bevels

Accurate bevels aid aligning and welding. Standard straight bevel for thickness (T) 3/16 to 3/4 inch inclusive. Standard U-bevel for thickness (T) greater than 3/4 inch.



True Included Angles

True included angles permit fabrication and erection of complicated piping systems to exact measurements.

welding fittings
flanges
GRINNELL

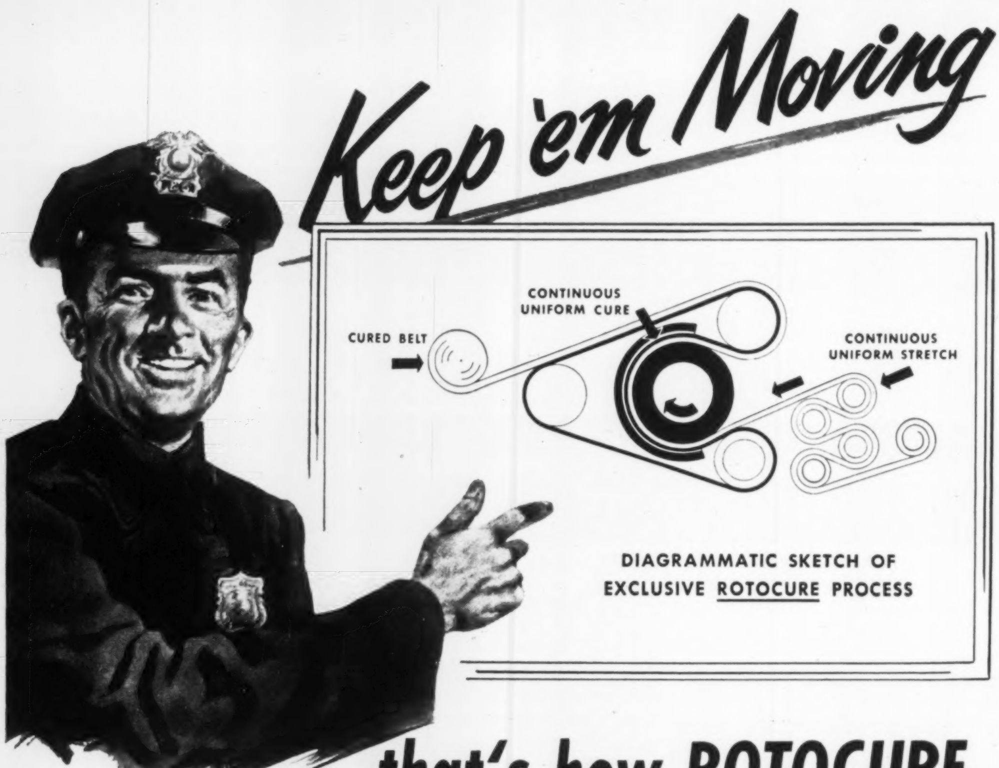
Send for copy of this new catalog showing the complete line of Grinnell Welding Fittings and Forged Steel Flanges.

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company Inc., Providence, Rhode Island • Sales Offices and Warehouses in Principal Cities

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems


Keep 'em Moving
CONTINUOUS UNIFORM CURE
CURED BELT
CONTINUOUS UNIFORM STRETCH
DIAGRAMMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS

—that's how ROTOCURE prevents OCS*—Achilles Heel of Conventional Belts!

"Start and stop" vulcanization (the conventional flat press method) can bump conveyor belt costs way out of line due to short life and constant replacements. Here's why: Press overlaps are *unavoidable* in this method of belt manufacture. They *result in overcured segments that weaken the belt.*

Why Rotocure-made Belts Are Superior to Flat Press

The BWH—pioneered method of ROTOCURE is a continuous, endless curing process of uniform belt advancement. Every inch of the belt is subjected to *identical* curing—in amount and in time. Thus weak segments due to overlapping are eliminated automatically by the process itself.

Why Rotocured Belts Should be on Your Jobs

The weak segments you *don't get* in BWH conveyor belts mean you *do get:*

1. **Increased belt flex life — up to 40%.**
2. **Elimination of mechanical distortion at the press ends.**
3. **Constant, uniform stretch.**
4. **Uniform, abrasion-resistant covers.**

For years, it's been an established fact among users that BWH Rotocured belts are "tonnage producers." If *you* want longer belt life, a good size dip in belt maintenance costs and savings per ton in materials conveyed ask your BWH distributor. He *knows* who's buying the values! Or write us direct.

*Overcured Sections-present every 30′ to 40′ in all belts made by the flat press method. Only Rotocuring (continuous, non-stop curing) eliminates this major cause of belt failures.

BWH DEPENDABLE RUGGEDNESS

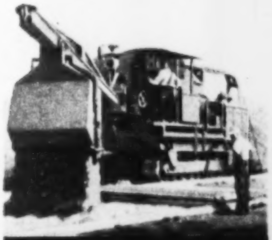
Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois **Distributors in all Principal Cities**

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

FOR PUMPING



FOR PAVING

FOR PLOWING

THIS IS THE DIESEL

for any job from 32 H.P. up

MAYBE this headline surprises you, but it's a fact. General Motors has made it possible to have Diesel power in places where it was never used before—even on jobs requiring as little as 32 horsepower.

The reason is that GM engineers have compressed Diesel power into a smaller, lighter weight engine that provides Diesel economy and Diesel efficiency without sacrificing ruggedness. This sturdy 2-cycle Diesel fits almost anywhere a gasoline engine does—*and gets more work done faster, easier and cheaper.*

It is simple to operate. It starts quickly. It burns fewer gallons of safer, lower-cost fuel. It takes less time out for servicing. And it costs less to maintain than either gasoline or other Diesel engines.

You can have this thrifty, hard-working Diesel in more than 750 different kinds of equipment built by over 150 manufacturers. Write us for the list. And ask your GM Diesel dealer to show you the savings this Diesel can make in *your* kind of operation.

DETROIT DIESEL
ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 32 to 275 H.P. Multiple Units . . . Up to 800 H.P.

GM
GENERAL MOTORS
DIESEL
POWER

Our supervisor reports: "Bottom is dry well below subgrade. Banks in excellent shape. Contractor pleased."

He's talking about the job pictured — OVERPECK VALLEY SEWER REPLACEMENT at Ridgefield Park, N. J. UNION BUILDING & CONSTRUCTION CORP., PASSAIC, Contractors.

Their Problem: Remove and re-lay a 60-inch reinforced concrete sewer under the New Jersey turnpike, in an area loaded with sand piles and 18 feet of water in silt, sand and clay.

Our Solution: Install a MORETRENCH WELLPOINT SYSTEM to predrain the soil. Dig in the dry. Eliminate sheeting. Slope the banks.

Solving pumping problems is our business. Contact our nearest office for quick action on yours.

Once again, Union Building & Construction Corp. saves time and money by pumping with MORETRENCH!

MORETRENCH CORPORATION

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Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

Baltimore's Battle Monument to her heroic dead in the War of 1812, as it looked 100 years ago.

Baltimore, Maryland has cast iron water and gas mains in service that were installed more than a century ago. In addition, there are more than 28 other cast iron water or gas mains with known records of continuous service for more than 100 years in the older cities of the United States and Canada. Such service records prove that cast iron pipe not only resists corrosion effectively, but is endowed with all the strength factors that pipe laid under city streets must have to meet the stresses imposed by modern conditions of traffic and underground services.

United States Pipe and Foundry Co.,
General Offices, Burlington, N. J.
Plants and Sales Offices Throughout the U. S. A.

U.S.
PIPE

NUMBER TWO OF A SERIES

GENERALS

GO IN—GET THE LOAD—CARRY IT OUT AND OVER THE HIGHWAY

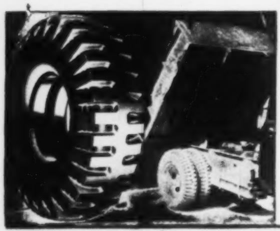
FASTER! EASIER! At Lower Cost!

"OFF-THE-ROAD"
"ON-THE-ROAD"

THE GENERAL D.T.L.
THE GENERAL H.C.T.

GENERAL D. T. L. with deep, sharp, angled cleats and sturdy, high shoulder lugs. Designed for maximum traction on soft surfaces—forward or backward.

GENERAL H. C. T. for trucks that go off-the-road to pick-up, deliver loads. Free-rolling tread and stronger body for more miles, more safety.



GENERAL NON-DIRECTIONAL CLEATED

Best for dump trucks. Self-cleaning tread for extra drive-wheel traction forward or backward.

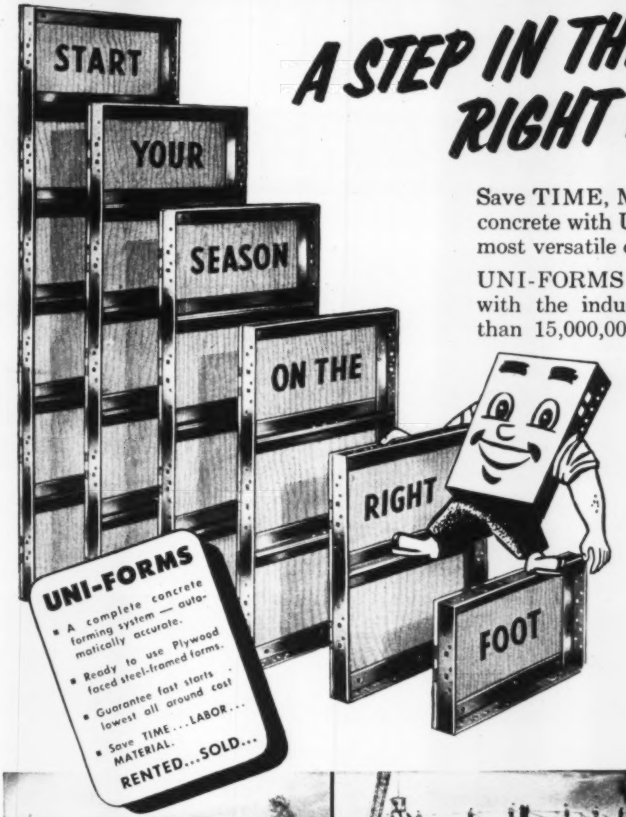
GENERAL TRACTOR GRADER

For power wheels—sharp, self-cleaning tread for extra traction. For front wheels—easy steering, smooth riding ribs.

Specify **GENERAL TIRES ON YOUR NEW EQUIPMENT**

UNI-FORMS... "TOPS" in CONCRETE FORMING

A STEP IN THE RIGHT DIRECTION


START
YOUR
SEASON
ON THE
RIGHT
FOOT
UNI-FORMS
• A complete concrete forming system — automatically accurate.
• Ready to use Plywood faced steel-framed forms.
• Guarantee fast starts lowest all around cost
• Save TIME... LABOR... MATERIAL.
RENTED... SOLD...

Save TIME, MATERIAL, LABOR—form your concrete with UNI-FORMS—the world's fastest, most versatile concrete forming system.

UNI-FORMS are standard forming equipment with the industry's leading contractors. More than 15,000,000 sq. ft. now in use. Investigate UNI-FORMS today. Watch them work—there's a UNI-FORM job near you now. Write for the UNI-FORM catalog and complete details.

UNI-FORMS FORM ANYTHING!

Bridges, Overpasses, Culverts

Concrete Houses, Apartment Buildings

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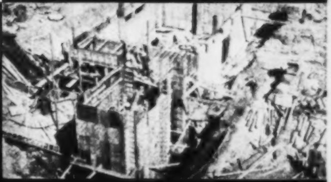

Heavy Industrial Structures

Universal FORM CLAMP CO.

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General Offices and Factory • **1236-38 NORTH KOSTNER** • **CHICAGO 51, ILLINOIS** • *CApitol 7-1600*

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THE

SCHRAMM

AIR COMPRESSOR

THAT WILL

- **PUSH** Anything a wheel tractor will push
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- **PROVIDE AIR** for every compressed air job! For full details on the versatile Schramm *Pneumatractor*, write today for Free Literature.

SCHRAMM INC.

The Compressor People

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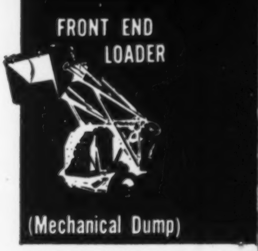
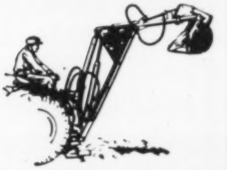
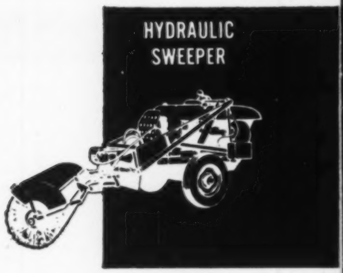
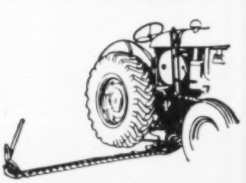

FRONT END LOADER
(Mechanical Dump)

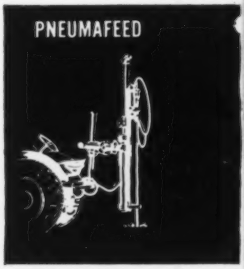
PIPPIN BACK HOE



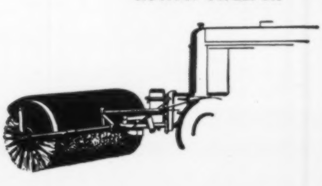

HYDRAULIC SWEEPER

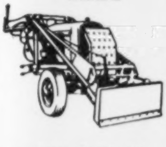
MOWER

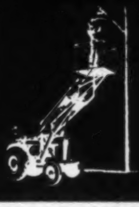


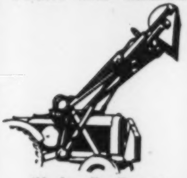

PNEUMAFEED

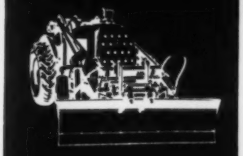
ROTARY SWEEPER

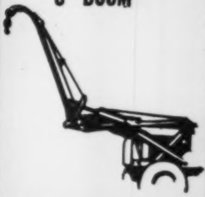


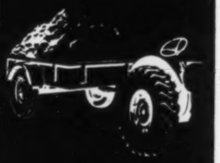

5′ BACKFILL BLADE
(Mechanical)

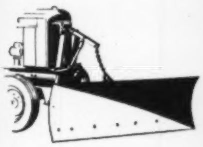

SCAFFOLD

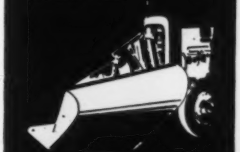

FRONT END LOADER
(Hydraulic Dump)

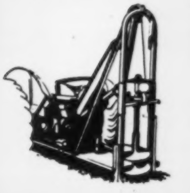

7′ BACKFILL BLADE
(Hydraulic Angling)

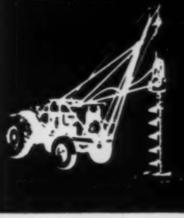

8′ BOOM

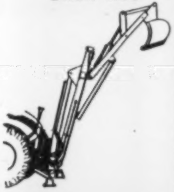

TOWING TRAILER

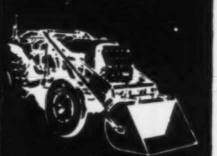

SNOW PLOW REVERSIBLE

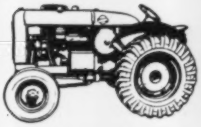

SNOW PLOW V-TYPE

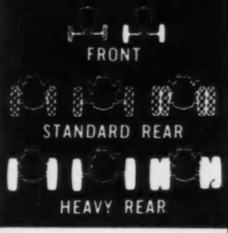

POST HOLE DIGGER


EARTH AUGER

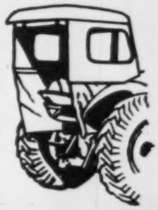

OTTAWA BACK HOE

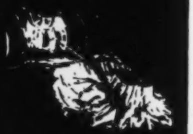

SNOW BUCKET

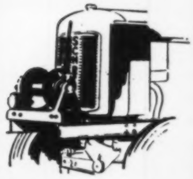

HYDRAULIC STEERING

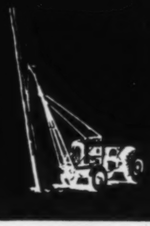


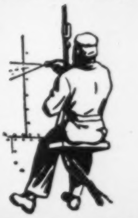
WHEEL ARRANGEMENTS

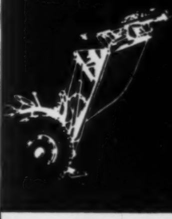

OPERATORS CAB

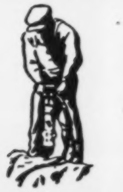

REAR WINCH

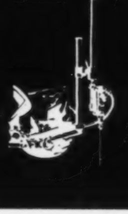

FRONT WINCH

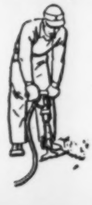

"A" FRAME

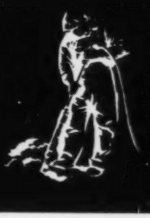

SPRAY PAINTING

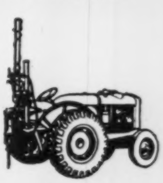

PNEUMADRILL

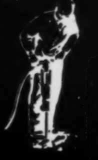

ROCK DRILLING

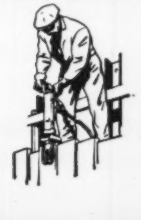

PNEUMAJACK

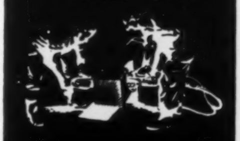

CLAY SPADING


BACKFILL TAMPING


PNEUMABREAKER


CONCRETE BREAKING


DRIVING SHEETING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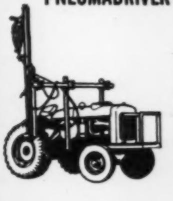
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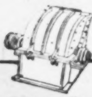
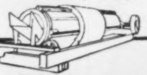
Diamond "66" plant at Nagelkirk & Ranta job site near Grand Rapids, Michigan. Note power unit installed over delivery conveyor for accessibility and easy travel. Power unit need not be removed when on road.

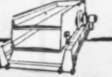
Everything. . . for the aggregate producer



Hammermills



Scrubbers



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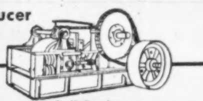
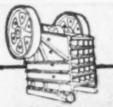


Roll Crushers



Jaw Crushers

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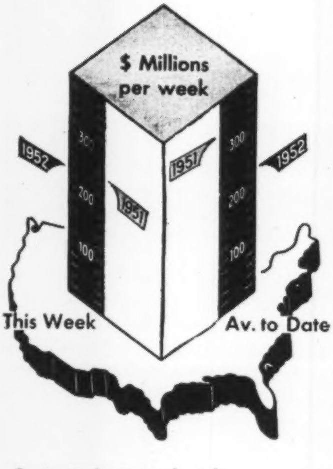
THE CONSTRUCTION WEEK



Contracts by type of work

	This Week	Cumlative 7 wks 1952	1951	% chge
Waterworks.	$3.6	$41.2	$20.6	+100
Sewerage ...	2.4	23.4	47.1	—50
Bridges	4.3	26.7	43.6	—39
Highways ..	17.0	143.4	120.4	+19
Earthwork, Waterways.	8.6	56.4	37.9	+49
Buildings:				
Public	37.3	200.6	393.4	—49
Housg., pub.	23.3	102.9	125.7	—18
Housg., priv.	51.9	352.9	298.2	+18
Commercial	19.2	56.1	113.6	—51
Industrial..	44.8	421.7	956.8	—56
Unclassified .	21.1	172.1	156.9	+10
Total	**$233.5**	**$1,597.4**	**$2,314.2**	**—31**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR COST INDEX

Index Base = 100		**1913**	**1926**	**1949**
Constr. Cost..	Feb. '52	549.26	264.03	115.14
Bldg. Cost ..	Feb. '52	406.05	219.50	115.42
Volume	**Jan. '52**	**470**	**191**	**136**

TIME GROWS SHORT—From the trend of government maneuvers to head off a strike in the steel industry, both the price rise and the wage increase predicted in ENR Dec. 27, p. 15 appear to be proving on target. Steel price increases will probably be between $4 and $8 a ton; the wage increase about 15 cents an hour—this is election year. But the wage increase will come first. The Wage Stabilization Board is set to complete hearings this week and is expected to announce its findings shortly. Whether the steel industry will accept its decision without a guarantee of adequate prices to cover increased costs, is the question. Present deadline for the answer is the CIO steelworkers Feb. 24 strike threat.

CHANGES DUE—Look for these changes in NPA's newly revised version of Regulation 6, due for release within the next two weeks: Restrictions on foreign steel will be lifted, provided using the steel doesn't entail all use of copper; the two-ton limitation on structural steel for commercial construction will be kept, although as originally written, the revised order would have eliminated structural steel for commercial work completely. Credit for the revisions will go to the Construction Industry Advisory Committee, which spent what its members described as its "most useful" session in Washington consulting on the revision this week. Another change likely as a result of the meeting: Some further liberalization in restrictions on housing, to appease electrical contractors and plumbers.

SQUEEZE PLAY FOR MVA?—As President Truman last week named an 11-man commission to survey the Missouri Basin, he made one point clear. He is unhappy with the work of the Missouri River States Committee which opposes a Missouri Valley Authority, and recently (ENR Feb. 7, p. 25) voted to draft a regional-federal compact for management of the basin. He brushed aside the committee's protest, commenting that objections were voiced by "those who have vested interests in the status quo." The commission (which includes one engineer) will make "thoroughgoing and impartial review of plans," he said. Members named are: James E. Lawrence, editor of the Lincoln (Neb.) Star, chairman; Sen. T. C. Hennings, Mo., vice-chairman; Sen. James E. Murray, Mont.; Sen. M. R. Young, N. D.; Rep. W. N. Aspinwall, Colo.; Rep. C. R. Hope, Kan.; J. W. Trimble, Ark.; Fred V. Heinkel, president of the Missouri Farmers Assn.; Kenneth Holum, farmer; H. J. Peterson, Minnesota Assn. Cooperatives; and H. T. Person, dean of the School of Engineering, U. of Wyoming.

IN THIS ISSUE—Highway officials fight drastic cut in budget funds (p. 43) . . . Congress is inquiring into housing mortgage money (p. 44) . . . Hedin Construction Co. files an appeal with the Wage Stabilization Board (p. 46) . . . Metals shortages are causing redesign in building hardware (p. 48) . . . Power is developing fast in Europe (p. 155) . . . Other departments: Municipal (p. 161) . . . Men and Jobs (p. 163) . . . Obituaries (p. 164) . . . Meetings (p. 167) . . . Research (p. 170) . . . New Products (p. 173) . . . Labor (p. 180) . . . Unit Prices (p. 182) . . . Construction Reports (p. 188).

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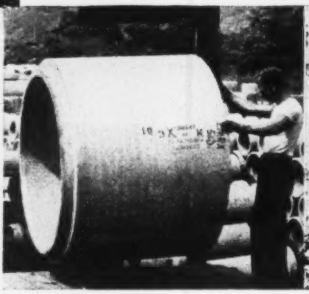

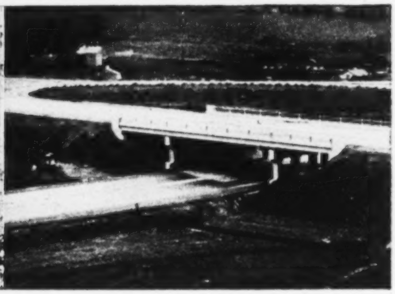

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FEDERAL AID HIGHWAY FUNDS

Thomas H. MacDonald, commissioner of public roads, gave the background for the Administration's highway budget proposals.

Bertram D. Tallamy, president of AASHO, said highways need double the amount proposed in the administration budget.

R. H. Baldock, Former AASHO president, charged the Administration with foggy thinking in its budget proposal.

Builders fight cut in highway funds

Two subcommittees on roads—one in the House and the other in the Senate—made it clear last week that they favor more federal aid for highways than the President has recommended.

The two congressional groups held initial hearings on bills that propose from $400 million to $700 million for each of the two fiscal years starting July 1, 1953, and July 1, 1954.

As the first witness before each of the subcommittees, Commissioner Thomas H. MacDonald of the Bureau of Public Roads was in the ambiguous position of having to support an administration bill calling for $400 million of federal aid. This bill had been introduced at the request of the Secretary of Commerce by Chairman Charles H. Buckley of the House Public Works Committee.

Members of the roads subcommittees sympathized with the commissioner in his anomalous position. House subcommittee Chairman George H. Fallon put the feeling into words:

"This committee has the highest respect for you, Mr. MacDonald. I can only say that we feel sorry for you when you have to defend and support a measure that we all know falls short of the minimum needs." Committee questioning gave the commissioner ample opportunity to define the real scope of highway needs.

• Growing need shown—Although Mr. MacDonald asked for no increase in federal aid, the figures as to the present status of the federal-aid program that he gave to the committee clearly demonstrated the need for a much larger highway program. So did his statement concerning the relation of highway transport to the national economy.

The mileage of projects on the federal-aid system completed annually between 1948 and 1951 dropped 4,725 miles, Mr. MacDonald said. "The serious implication of the downward trend in the annual rate of rehabilitation is illustrated by the growing obsolescence of the highway plant. A tremendous backlog of highway needs has been accumulating. As of today, nearly two-thirds of all federal-aid system mileage is below tolerable standards of adequacy and should have early improvement."

• Highways during the emergency—Concerning highway work during the current emergency, Mr. MacDonald said:

"There is valid argument that the highway program shall be well considered and well planned to meet essential needs during a period of national emergency to conserve critical materials, manpower and funds. It must be realized, however, that the present rate of reconstruction on the federal-aid system is far below the rate required to meet critical highway needs within a 15-year period."

Going beyond the federal aid sums mentioned in House or Senate bill, the two subcommittees showed keen and friendly interest in the larger recommendation of the American Association of State Highway Officials.

• State position—President Bertram D. Tallamy and his AASHO colleagues presented a strong argument for $810 million a year—with $210 million of it earmarked for the interstate system—as the minimum required per year to correct present deficiencies in 20 years.

If federal aid for the fiscal years 1953 and 1954 is cut to $400 million, as proposed by President Truman, Mr. Tallamy said that it would take 40 years to meet urgent highway needs, without any regard to obsolescence or traffic increases.

"In testimony presented to Congress two years ago, the association estimated it would require $29 billion to bring the federal-aid system of highways up to date. This year our estimate has increased to $32 billion. In other words, during the two-year period we have fallen behind to the extent of $3 billion worth of construction in spite of the fact that during this period approximately $3 billion worth of work was actually accomplished on this system."

A program based on $800 million

(*Continued on next page*)

Highways cut

annually is needed, Mr. Tallamy said, to take care of the most urgent highway needs within a period of 20 years. He added that for every two dollars the federal government put up in federal aid, the states and their subdivisions spend $8 on construction alone.

• Serious traffic situation—As further evidence of the need for an expanded federal-aid program, Mr. Tallamy cited the growth in truck registration from 5 million in 1945 to more than 9 million today, and the even greater increase in ton miles of freight moved over the nation's highways.

Like views were expressed by R. H. Baldock, Oregon state highway engineer and a former president of the AASHO. He said that we are attempting to jam 52 million vehicles onto roads built for half that number.

• Roads in Central America—Mr. Baldock was sharply critical of the federal-aid bill sponsored by the Administration, observing that while it would reduce the federal aid to the states of this country to $400 million, it proposed an additional authorization of $64 million to be spent on roads in Central America. It is difficult to understand the thinking in the President's budget message, he said.

Earmarking of funds for the interstate system stirred up some searching questions. The AASHO recommends it this time on a 50-50 federal—state matching basis, instead of the 75-25 ratio proposed two years ago. After AASHO witnesses explained that the 50-50 formula would apply on the same sliding scale as for other federal aid—with the federal government paying a greater share in the states where it owns large areas of public lands—several committee members said they would favor earmarking funds for the interstate system.

Under questioning by Chairman Spessard L. Holland of the Senate Subcommittee on Roads, Mr. Baldock said the AASHO urges separate funds for the interstate system only in addition to a minimum of $600 million for the primary, secondary and urban systems. If Congress decides on $600 million or less for federal aid, the AASHO recommends no earmarking out of such funds for the interstate system.

In the 1950 Highway Act, Congress authorized $500 million a year of federal aid. That authorization runs out June 30, 1953. The present Congress will vote no less in the 1952 highway measure, to be enacted at this session. The new act is more likely to authorize federal aid greater than $500 million a year.

• Summary—There are four bills now before Congress, three in the House and one in the Senate. One of the House bills is identical with the Senate measure introduced by Chairman Dennis Chavez of the Public Works Committee. It proposes $600 million of federal aid distributed as at present, 45% to the primary system, 30% to secondary and 25% to urban.

Another House bill, by Rep. George A. Dondero of Michigan, ranking minority member on the Public Works Committee, recommends the same amounts for regular federal aid and adds $100 million for the interstate system, making $700 million in all. Other highway authorizations—tacked on to the main federal aid measure—increase the totals.

Only the administration bill departs from the present 45-30-25 distribution of federal aid. The $400 million of aid in that bill is apportioned 50% to the primary system and 25% each to the secondary and urban.

Hearings will be resumed the week of Feb. 18.

Housing mortgage logjam aired at hearing

Private lenders and government housing officials sat in huddle for three days last week with the Senate Banking Committee. Purpose: to diagnose the mortgage market and find ways of attracting more money into government-sponsored loans—particularly for defense and veterans' housing.

Exchange of views during the three morning sessions cleared the air. The lenders and the government people were not far apart in basic thinking, but they differed in details. At the close of the hearings, both sides were better equipped to understand the reasons for the differences in opinion.

But neither gave any signs of changing soon its present policies on mortgages. Government men put up a good defense of interest rates and long-term security of both FHA-insured and VA-guaranteed loans. The investors, on their part, showed why they hesitate to increase their purchases of 4 and 4¼% mortgages—especially in remote defense areas.

So far as immediate action is concerned, the result of the conference was a standoff. But clearer understanding of the mortgage problem on both sides gave hope for later improvement of the mortgage market.

There was no suggestion by the lenders that the government back down from its dominant position in the mortgage field. In fact, most of the investors seemed to think that Congress should vote more authority to the Federal National Mortgage Assn. (Fannie Mae) to make advance commitments for loans on defense housing and GI homes in rural areas.

Alan Brockbank, president of the NAHB, told of "never-never areas" in housing finance.

• Sore spot—President Alan Brockbank of the National Association of Home Builders put his finger on the sorest spot—money for defense housing.

On the first 69,000 units programmed, he pointed out, builders put in applications for 201,000. But the builders are blocked by inability to get mortgage loans. Practically the only loans made were arranged under Fannie Mae's $200 million. Authority to make pre-commitments, and that was exhausted before year-end.

The Federal Housing Administration, which insures the defense housing loans, is not so sure that private money won't come forth to finance the projects.

FHA Administrator Franklin Richards pointed out that loan applications for 16,000 units had been received since the program started in November. He didn't say so, but it's more than likely that these loans are covered by Fannie Mae takeouts.

Investors are leery of defense housing loans for two reasons, he explained.

First, the loans are a new type, and they don't know too much about them.

Second, the investment people

won't take a chance even on insured mortgages for defense areas that may not be permanent.

They suggested ways of improving protection for the investor in case of default. Richards countered by showing that the insurance contract already covers every protective device suggested.

In fact, Richards said, the security of the loans is much better than on World War II housing, when only 1% of the loans went sour.

Even so, big lenders at the conference made it clear that they would not soon change their policy on defense housing loans. The housing cannot wait until the investment institutions are ready to accept the loans. Congress will probably have to extend Fannie Mae's authority by another $1 billion at the present session. The agency has $395 million now for buying defense housing mortgages—but not for pre-commitment. That sum would take care of only 96 of the first 145 areas programmed—with many more to come.

GI loans are in a better position than defense housing. T. Bert King, director of the VA loan guarantee service, said that GI mortgage money is sparse and spotty but that VA is still originating up to 30,000 loan guarantees a month. In January the agency guaranteed more than 127,000. The investment men at the meeting generally stated that their institutions were maintaining or increasing the percentage of GI loans in their over-all portfolios.

• Broad view—Attending were officers of national savings and loan leagues, insurance companies, savings banks and commercial banks. They represented a good cross-section of the principal sources of mortgage funds. With them were officials of the mortgage bankers and builders, as well as of the Federal Reserve Board and government agencies concerned with financing of houses. In all, the banking committee had the advice of two dozen experts.

Even with today's shortcomings, the mortgage market will support the financing of 800,000 new units this year. That is the "ceiling" rate desired by the government. FRB Chairman William McC. Martin outlined the prospects as he sketched the broad financial backdrop of housing mortgages today.

With government deficit financing of some $10 billion required this year, the market could not support a $6.5-billion net addition of housing loans—as it did last year—without causing excessive expansion of bank credit. Such credit expansion, would be decided inflationary.

But the market is able to supply the $4.25 billion of additional credit—out of expected savings—to finance new starts at a rate of 800,000 a year.

• Outlines needs—To do that without inflationary pains, Martin said, would require some help on two points. He would like to see credit extensions in connection with existing properties regulated selectively, as the FRB has recommended. And he would be relieved if the issuing of tax-exempt bonds for public housing could be curtailed. The bonds not only absorb money that could be better used elsewhere, they also give wealthy individuals and corporations a chance to reduce tax payments at a time when tax revenues are desperately needed by the government.

Anticipated savings for the year are good—barring another scare buying spree by the public savings banks, for example expect a net increase of $1.5 billion, as compared with $876 million last year. And the savings and loan associations look for a net growth in resources of $1.5 billion, 25% higher than in 1951. These savings will help to take up the mortgage offerings this year.

Nobody at the round table discussions—presided over by Chairman Burnet Maybank of the Banking Committee—speculated on the market possibilities for financing more than 800,000 new units. Builders are expected to conserve and stretch critical materials to permit the starting of more than 900,000 units this year. Lack of money is the only thing that would be sure to stop them. Judging by sentiment at the meeting, the money can be found if home buyers are willing to pay 4½-5% on conventional mortgages.

CITY IS BORN—Lakewood Park, Cal., a development of 8,000 houses near Los Angeles, has sprung up in less than 24 months. Builders used assembly line methods, envision a total of 17,000 before the job is completed. Price for two- and three-bedroom houses ranges from $9,195 to $12,000. But do mortgage requirements hamper similar developments in other areas? Congress is pondering. (Wide World photo.)

$90-million toll road to conquer mountains

West Virginia's State Turnpike Commission disclosed last week that it is awaiting only a federal allocation of steel before arranging to issue $90 million in revenue bonds to finance construction of an 88-mi toll superhighway from Princeton to Charleston.

A report submitted by Enoch R. Needles, New York consulting engineer, states that the initial toll road will be 30 miles shorter than a previously disclosed route from Princeton to Fairplain, by way of Charleston. He said the stretch now programmed is part of an eventually regional project to "break the backbone" of West Virginia mountains so that traffic can roll over direct routes from the Great Lakes to the Carolinas.

Connecting toll highways in Virginia and North Carolina are anticipated soon after the West Virginia highway is completed. The project calls for about 30,000 tons of steel and erection of 85 bridges. Over-all width of the expressway will be 42 ft, including 24 ft of hard-surface with 9 ft of asphaltic shoulders on each side. The 24-ft will provide for only two traffic lanes, but an extra lane for slow-moving vehicles will be built in where curves or grades prevent long-sight distances.

• Ohio cut—The Ohio Turnpike Commission agreed last week to chop 60 mi from the 241 planned for its superhighway across the northern part of the state to enable bankers to draft an "open end" bond indenture for $235 million. Additional bonds to finance the final 60 mi from Naumee to the Indiana state line will be issued later.

Hedin files appeal with WSB

Oral hearing of J. D. Hedin Construction Co's protest against stiff penalties imposed for alleged wage violations probably will be held at the end of February.

Chances that the Washington construction firm will induce the Wage Stabilization Board's National Enforcement Commission to reduce the $80,000 penalty imposed by the Detroit regional commission, if not reverse findings entirely, appeared good as Hedin attorneys filed their appeal in Washington.

Felker & Carter, attorneys for Hedin, asked for hearing on Feb. 28. The hearing will be held about that time.

Meanwhile, the Hedin firm has been awarded an $872,500 contract by the District of Columbia commissioners for a 17-room addition to Browne Junior High School in the capital city.

Hedin paid bricklayers $3 an hour last year on the construction of a $7,152,000 hospital for the Veterans' Administration at Ann Arbor, Mich. WSB enforcement commission in Detroit found that the "legal" rate under wage stabilization was only $2.75, and that Hedin paid a total of $116,131.50 in wages at the $3 rate. (The extra 25 cents an hour amounted to $9,676.76.) The commission determined, however, that the VA should deduct $40,000 from the price it is paying Hedin and that another $40,000 should be disallowed by the Bureau of Internal Revenue as a cost in determining Hedin's income tax. In all, the penalties would cost Hedin about $72,000 (ENR Jan. 31, p. 23).

• **Basis for appeal**—Hedin's attorneys, in their appeal to the national commission for review, contend that the government has no legal right under the Defense Production Act for deducting the $40,000 from the fixed price of the hospital.

Nor, Felker & Carter contend further, was the $3 wage paid bricklayers an "illegal rate." They assert that there is no fixed lawful rate; that "area rates" were not defined by the government until last July, and that $3 became the "area rate" on Oct. 15.

But what seems to be Hedin's strongest point is the argument that the amount of penalty determined by the regional commission is "out of harmony" with its own findings mitigating and extenuating circumstances existed for paying the $3 wage.

The commission cited these points in Hedin's favor:

- "There was no proof that particular bricklayers left the employ of any contractors in the Ann Arbor area or Detroit areas in order to obtain the $3 rate at the hospital project."
- Hedin did not engage "in deliberate 'pirating' of bricklayers."
- Hedin appeared to be "engaged in a sincere effort to fulfill its contract and believed erroneously that the payment of the $3 rate was in accordance with a widespread practice of offering special inducements to bricklayers."
- "Due to causes beyond (Hedin's) control," construction was "substantially delayed." The VA was "insistently pressing for greater progress." The contract called for a penalty of $250 a day for delay, and by the end of last November the delay amounted to 73 days.
- "Hedin did not hide its rates, or resort to subterfuge to evade the regulations."

"We have given this honesty and frankness some weight in mitigation of our recommended disallowance," the regional commission stated, although criticizing Hedin for failure to conform to the regulations. The commission inferred it was being "lenient" with Hedin because its case was one of the first enforcement cases and, because it was not guilty of "dishonesty or concealment."

Yet, a check by Engineering News-Record of what has happened in other situations of violations, indicates that the penalty imposed on Hedin is the stiffest dealt out thus far.

In most cases where penalties have been imposed up to now, the amount of penalty has been only the excess wage payment. In Hedin's case, this would be a disallowance for tax purposes of only $9,676.76, instead of $40,000.

In only one case, besides Hedin, has the penalty gone above the excess amount. In that situation, a hotel was penalized twice the excess—a total of $537.44—as a tax disallowance.

In another case, where the employer had consented to a tax disallowance of $1,000, the Regional Enforcement Commission concluded that the circumstances were so extenuating that no penalty should be suffered. This "whitewashing" of the employer is being appealed to Washington by the regional enforcement officers who had agreed with the employer on a $1,000 disallowance. The commissions serve in a judicial capacity and are independent of WSB's enforcement officers.

• **Tough decision**—Hedin appears to have been dealt with harshly by the Detroit commission in two ways, assuming that the extenuating circumstances existed as the commission said they did.

First, the amount of tax disallowance—$40,000—is the highest not only in actual dollars but in relationship to the total illegal wages alleged and to the amount of excess wage payments.

Second, Hedin is the first employer—including 7,000 who were penalized for wage violations during World War II—against whom the government has done more than assess a disallowance for tax purposes. While the wartime and current laws permitted the government to deduct illegal wages from the cost on government contracts, this was resorted to for the first time against Hedin. The Detroit commission would have the VA knock $40,000 off the price it agreed to pay Hedin for the Ann Arbor hospital.

Wilful violators can also be fined $10,000 and sent to jail for a year, if the Dept. of Justice prosecutes. That has never happened.

St. Lawrence discussions in progress in Canada

Preliminary discussions of an application to the International Joint Commission for a permit to develop the international section of the St. Lawrence River for power and navigation are taking place in Ottawa Feb. 14-15. Lt. Gen. Lewis A. Pick, Chief of Engineers, U. S. Army, is the engineer member of the seven-man team attending from the U. S.

The team was sent in conformity with an agreement reached in January as the result of a request from the Canadian government that the U. S. government join it in such an application should Congress fail to approve the 1941 agreement, as requested again by President Truman in his message to Congress (ENR Jan. 31, p. 27 and Feb. 7, p. 19). The State Department said the discussions are to be purely exploratory.

President Truman sent the exchange of notes to Congress with that message. The Canadian Ambassador's note to the Secretary of State said, in part:

"The Canadian Parliament has recently passed legislation providing on the one hand, for a power development on the St. Lawrence River, to be undertaken by the Hydro-Electric Power Commission of Ontario and an appropriate agency in the United States, and on the other hand, for the establishment of the St. Lawrence Seaway Authority to construct the seaway either in cooperation with the United States, as provided for in the 1941 agreement, or as a solely Canadian undertaking. This legislation may now be brought into force at any time by proclamation."

Stretch-out on arms to spur non-military construction

You're going to be hearing a lot about Truman's new ceiling on spending of the military. It has a lot of meaning for the construction industry, in particular.

But to see what's going on now, you have to look back at what's been going on since Korea:

After Korea, the U. S. got down to action, preparing for a real do-or-die war. The top decision was made to expand our basic economic facilities across the board—steel, aluminum, oil, electric power and the like—and at the same time expand our capacity for arms production to perhaps 80% of what we would need to fight an all out war.

Before Truman clamped down the ceiling, the military's buildup called for spending that would hit probably $7 billion per month by mid-1953 or so. Then the rate of spending would begin to drop steeply until it reached as low as $3 billion or $3.5 billion per month in 1954.

What Truman did was to slice this 1953 "peak" off the military's spending curve, and add it on to the end of the program. A lot of plans are being changed because of this.

• **Military set**—For strictly military construction, however, the outlook is the same as before. Actually, the "peak" plans of the Pentagon brass never got down to the point of translation into new construction requirements. For military construction alone, the program remains exactly what it was when the Pentagon spelled out its plans to Congress last spring.

On the other hand, the new plateau does have plenty of meaning for the whole of non-military construction, since the plateau generally means more materials for non-military uses, plus a much stronger emphasis on the civilian side of the economy, including huge backlogs of delayed building.

In actual dollar spending of the military, it won't make much difference for the 10-12 months ahead. They'll still be spending just about all they can to reach a rate of $5 billion total per month by January, 1952, with about $3.6 billion or so of this total going for hard goods and construction.

This new "plateau" means their spending will level off at about this $5-billion per month rate. Then, instead of dropping off sometime in 1953, the Truman plateau calls for continued spending at the $5-billion rate clear through 1953, and probably 1954.

• **Leveling off**—So, 1953 becomes a "plateau" period instead of being a period of sharply rising military production and demand. According to Wilson and the other top mobilizers, to have followed the military's "peak" program would have meant a vastly greater diversion of materials and capacity to military production. Then sometime later in 1953, military spending would drop off sharply and we would have the problem of reconverting to civilian uses the plants used to hit the military's "peak."

Now, instead of late 1953-54 being a period of sharp reductions in military spending, those two years—as far as present plans go—now call for military spending at the rate we plan to establish by the beginning of 1953.

The building of plant capacity to produce hard goods goes right along as scheduled. Most of it is under construction now. The fact is, however, that some of these plants won't now be used to produce arms—although the military say it would have been needed had the program remained their "peak" program instead of Truman's "plateau."

This accounts for some of the stories you hear and read about. Last week, for instance, General Electric announced that a huge new plant being built outside Louisville, Ky., to make jet engine parts will be used instead to make appliances.

• **Now at peak**—As far as metal consumption of the military program is concerned, you've already reached the peak rate of military take. That's the fairly firm conclusion of the mobilizers at this stage of the game.

The metals bite runs about nine months to a year ahead of end-item deliveries. Since we're hitting the plateau in deliveries about a year from now, you can figure that we are already on the plateau as far as diversion of metals to the military is concerned.

Hence the forecast: second quarter allocations are the lowest they'll ever hit for civilian uses. New steel and aluminum capacity will begin to be felt from then on, making it possible for allocations to the non-military construction and other items to go up rather than down from there on out.

But, assuming a general war is not precipitated, by six months or a year from now the situation would be made-to-order for another decision to slow down our re-armament, to reduce spending, to reduce taxes, to do whatever might be needed to give the civilian economy another jolt.

NEWS BRIEFS

• **$15-million Milwaukee shopping center**—Schuster & Co., Inc., Milwaukee, Wis., department store firm, plans to build a shopping center in the suburbs of the city. The 65-acre tract will have more than 50 stores in addition to the department store. Parking for 6,000 automobiles will take up two-thirds of the site.

• **Licenses to control industrial waste**—Industries and municipalities which discharge sewage and waste into Ohio streams will be licensed by the Ohio Water Pollution Control Board next September. The board, at public hearings, will study 20 types of control. Co-operation with the board has been pledged by the Ohio Manufacturers Assoc.

• **$18-million addition to aqueduct**—A second barrel to the San Diego aqueduct will be built if the voters of San Diego County approve a contract between the county water authority and the Navy. Congress has authorized $18 million for the project. The contract provides for repayment of the cost plus 2.6% interest.

• **Navy jet engine test plant**—Construction of the $50-million Navy jet aircraft engine assembly and test plant at Romulus, Mich., will get under way next month. Completion of the Romulus unit, slated to be a naval industrial reserve plant, is scheduled for the spring of 1953. It will consist of a main building containing 500,000 sq ft of floor space, 18 engine test cells and test building, on 160 acres of land.

• **Delaware River channel deepening**—The U. S. Army Corps of Engineers is considering a favorable report approving a $94-million project for deepening the Delaware River channel. The project was supported by a Philadelphia delegation.

• **New Reynolds plant causes hard feelings**—Disappointed by Reynolds Metals Company's announcement that it was locating its new $30-million aluminum plant at Gum Springs, Ark., leaders of nearby Benton, Ark., threatened court action against both Reynolds and Arkansas Power and Light Company. Members of the Benton-Bauxite Chamber of Commerce charged that a "deal" had been effected to charge the aluminum company lower electrical rates for locating at Gum Springs in the Arkadelphia area. Reynolds denies any such "deal," and so does the power company.

E. F. SUTPHIN, president of the Hardware Manufacturers Statistical Assn. sees some permanent changes underway as . . .

Shortages reshape hardware

ENR Staff Report

The defense mobilization program is forcing a new trend in the building hardware industry—a trend which some of the industry's spokesmen say may stick.

The builders hardware industry has traditionally looked to copper and brass for materials. Today, facing cutbacks that have sliced their copper and brass allocations in half during the last three quarters, hardware manufacturers are planning to use more stainless steel. And they are directing their sights ahead to the day when aluminum will pass out of the research labs and onto hardware productions lines.

• Survey reviewed—This month ENR queried some 15 top manufacturers of builders hardware for an internal view of the industry. We asked industry spokesman E. F. Sutphin, president of the Hardware Manufacturers Statistical Assn. for a composite picture.

He had this to say: "Short range plans for the builders hardware industry call for brass-plated steel hardware. Most manufacturers are now using a clear plastic synthetic coating baked at high temperatures to replace clear lacquer." This, Sutphin added, will give the plated steel hardware a longer life span.

"Many hardware producers are installing equipment and revamping tools to use aluminum for products and trim of all kinds. Knobs, plates, window locks and trim will be turned out with an anodized finish to retain a permanent appearance of new aluminum."

He said you can be sure that the substantial investment being made now to switch over to aluminum will have a definite long-range effect on the builders hardware industry.

• The background—Last year when NPA began chopping non-ferrous metals allocations to hardware manufacturers, it started a slow drive in the industry to standardize the thousands of hardware products rolling off production lines.

Today manufacturers around the country are discontinuing slow-selling and short-run products. The trend is to keep inventories moving and center production on products in biggest demand.

For the present emergency, brass and bronze are trimmed to functional limits. And the red metal is being used prudently—in most cases retained only for coating or where it is featured in operational parts.

• Case histories—Changes being made by Yale & Towne, Stamford, Conn., are typical of new developments in the industry. In January, Yale & Towne issued a new, reduced-size catalog of products they will manufacture under CMP regulations.

The whopping cut in size indicates the move toward standardization. Fewer different designs exist within each major product class. Some fancier, and slower moving door knockers and specialty trim are eliminated.

But A. Charles Ammann, general sales manager, says there are enough products in the lines to meet contract specifications "since they contain those contract items in greatest demand."

One major switchover at Y&T is in the knob-type tubular lock. Yale is concentrating its copper and brass allocations on a recently trimmed down brass Home Duty Lock that is lighter in weight than its similar forerunner.

Philip B. Niles, vice president of marketing says Y&T can supply its share of hardware for over 850,000 housing starts this year with the trimmed down Home Duty Lock. Yale's optimistic view in meeting demand is weighed too, on a plan to turn out steel doorsets with brass finish for inside use—a product with trade resistance, but which Yale contends will have about the same quality as all brass sets, with perhaps a five year shorter life span.

Production of Yales mortice type doorsets is cut. Some miscellaneous window and door hardware is now on the market in brass finished cast iron and steel. And Yale plans a switch over from brass to steel for one brand of screen door closers.

Sargent & Company, New Haven, Connecticut, is developing a line of redesigned locks, exit bolts and night latches. And, when they hit the market, Sargent says, they will be improved in operation and appearance. NPA's low copper allocation last year is forcing Sargent into the steel and aluminum market for some products.

• Other cases—Segal Lock and Hardware Co., New York City, is banking on the general cut-back in new construction to meet buyers' demands. Like its competitors, Segal is discontinuing slow-moving and short-run lines. Segal considers aluminum as an alternate material, but finds tooling at present would not allow the conversion.

National Brass Co., Grand Rapids, Mich., manufacturers of residential hardware, is developing a line of products to cost 5 to 15% less than products they are replacing. Standardizatio nis again the keynote, and zinc will find a niche in National's production.

Schlage Lock Co., top door-hardware manufacturer in the West, is realigning production under NPA regulations. Under CMP restrictions, Schlage received only about 40% of non-ferrous metals needed in 1951. With the 60% cut, Schlage is converting to steel and glass for some of its door hardware. Production of push plates and door pulls has stopped entirely.

No new price range has been set

for the converted hardware, but Schlage thinks it may rise. While the steel and glass converted stocks will stand up well and have the solid Schlage company behind them, Schlage is ready to admit that the hardware is a temporary substitute and a fill-in line until non-ferrous metal supply improves.

• **Replacement**—Stanley Works, New Britain, Conn., manufacturers of hinges, bolts, brackets and door controls is taking the copper shortage in stride.

Stanley is now gradually converting copper and brass products to aluminum and stainless steel. Because its products are more easily adaptable to aluminum and stainless steel, Stanley has been able to keep production moving.

Stanley has no new products in the offing, but modification of existing products is in the program. Solid brass butts are out entirely. Stanley is saving its copper for hinge ball bearings and is changing over to galvanized or chrome stainless steel for hinge butts and pins.

The company also believes that an increased amount of aluminum will go into hardware and it is turning the sights to its use in future hinge manufacture.

Stanley's steel hinges will have corrosion resistance about equal to that of brass and copper hinges, says executive vice-president Morse. Exterior hinges will have a zinc-plated finish to withstand moisture conditions and constant wear. Mr. Morse says that chrome steel pin hinges will become more popular when the public realizes their full value. He agrees with his competitors that trade resistance to treated steel and aluminum will in time be broken down.

Stanley's door stops made traditionally of brass are now being manufactured of cast iron which has been zinc die-casted.

Stanley says that hardware prices will depend ultimately on the final outcome of the steel industry's wage negotiations.

• **New developments**—The American Hardware Corp. in New Britain, Conn. has a threefold development program in the works for its knob type tubular and cylindrical locks.

The changes that are involved will incorporate use of alternate materials and changes in design: 1) a line of heavy duty locks for industrial and commercial use is now in production stage; 2) in about nine months a standard duty lock for the low priced residential and commercial market will start rolling onto distributors shelves; 3) scheduled for tooling early this year is a competitive line of cylindrical locks.

American Hardware, originator of the tubular lock has two designs of their key-in-the-knob type lock on the market now—a cylindrical and a tubular. They are quite similar in appearance, but they differ in their operating mechanisms.

Chief Design and Development Engineer N. Welch points out that one of American's major developments is the perfection of an engineered knob lock with interchangeable parts. On-the-job assembly with this design can be made by an inexperienced man or woman in short time.

American has taken up the standardization trend. Indicative of this is the new catalog the company has under way which is sliced to less than half the original 800 pages first compiled in 1937. One example of the cut is in brass knockers and door handles.

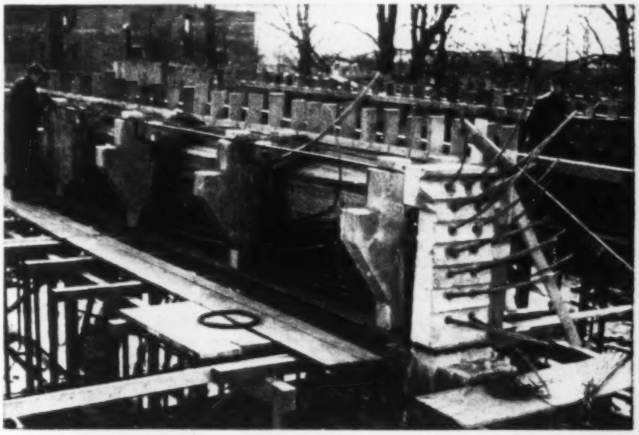
American had put about twenty-four different designs on the market. Today the list has been trimmed down to a concentrated five or six designs. Production of morticе-type locks is cut.

American has taken another step forward in standardizing the countless rivets, washers and springs required in the trade.

Power companies map expansion, progress

The Federal Power Commission has ordered that a 50-year license be issued to Niagara Mohawk Power Corp., of Syracuse, N. Y., for a $22 million power project on the Raquette River. . . . Consolidated Edison Co., of N. Y., will shortly try to borrow $50 million to get a $105 million expansion project started. . . . Dayton Power and Light Co., Dayton, Ohio, has announced a $38 million expansion program to be completed in 1952-53. The firm has spent $96 million since the war in extending lines and adding plant facilities. . . . Oklahoma Gas and Electric Co. has been authorized to issue $12 million in bonds to finance new construction.

• **Progress**—Concrete pouring for the Washington Water Power Co.'s $40 million Cabinet Gorge hydroelectric dam on the Clark Fork River in Idaho is proceeding at the rate of about 1,000 cu yd per 24-hr day. About 66,000 yd has already been placed and most of the arch-shaped dam is expected to be completed by April 1. . . . The $45 million Ohio Power Co.'s generating plant on the Muskingum River in Southeastern Ohio, is nearing completion.



PRESTRESSED CONCRETE GIRDERS are being fabricated for a new building for Manhattanville College, at Purchase, N. Y. Spanning 65 ft, they are 4-ft deep I-beams, made of 5,000-psi concrete, which is precompressed with 22 cables. In each cable, there are twelve 0.192-in. wires that will be tensioned initially to 150,000 psi. Seven cables are anchored at the top of the beam, the remainder at the precast end block. The wires will be flared out through a conical opening, passed through 12 tapered holes in a 1¼-in. steel anchorage plate and after the beam has been poured and cured, wedged to a jack that will tension them. Finally, two wedges will be driven into each hole to anchor the wire. Beam seats were precast and set in the girder forms. These girders require only 8.08 tons of steel compared with 72 tons for steel girders. The Preload Co., Inc., designed the girders. Eggers & Higgins are the architects; Weiskopf & Pickworth, consulting engineers; and George A. Fuller Co., the general contractor. (Geo. A. Fuller Co. photo)

CLAY PIPE—*ESSENTIAL* ★ *ECONOMICAL* ★ *EVERLASTING*

Tucson, Arizona, enlarges its municipal sewerage facilities in a $2 million program caused by defense expansion. Clay Pipe is specified not only for the sewerage project, but for the new electronics plant, the adjacent airport, the additional housing, and the Air Force base which made it necessary.

84 MILES OF CLAY PIPE INSTALLED IN TUCSON MUNICIPAL SEWERAGE PROJECT

Over 440,000 feet of Vitrified Clay Pipe, in sizes ranging from eight to twenty-one inches, are being installed to meet the problems posed by defense plant, airfield, and housing construction in Tucson. The defense projects, totalling over $20 million, have caused an influx of thousands of people. Vitrified Clay Pipe sewerage systems will give them the *permanent,* corrosion-proof sanitary facilities that prevent sickness and epidemics.

Clay Pipe is the *only* chemically inert pipe . . . the only pipe that's unaffected by rust, rot, decay, sewage gases, or acid action. It's the one pipe that has *proved* its resistance to chemical action through decades of actual performance in the ground. Don't take chances with non-clay materials. Specify Vitrified Clay Pipe . . . *it never wears out!*

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Rantoul, Ill. (Chanute Field)	158,000 ft.
Orlando, Fla. (Air Force Base)	74,000 ft.
Morrisville, Pa. (New Steel Defense Plant)	300,000 ft.
Rapid City, S. D. (Air Base)	54,000 ft.
Bakersfield, Calif. (Air Base)	196,000 ft.
Panama City, Fla. (Municipal Expansion)	450,000 ft.
Limestone, Me. (Air Force Base)	65,000 ft.
Tucson, Ariz. (Air Base)	440,000 ft.

Vitrified
CLAY
CLAY PIPE NEVER WEARS OUT!
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77th ANNUAL REPORT

What Happened, What's Ahead in BUILDING AND CONSTRUCTION

AN EDITORIAL APPRAISAL OF BUSINESS FACTS AND TECHNICAL TRENDS

LOOKING FORWARD to discern the problems and measure the fortunes that 1952 holds for construction and all the people who make a living from it is the objective of this issue.

The record of the year just passed—as impressive as any in the nation's history—provides a substantial benchmark. The forces—economic and governmental—that then were acting furnish the key to the direction and speed of what lies ahead. The technology and methods that proved economical and inviting under the restricted conditions of 1951 are certain to be repeated. And the spectacular growth in the backlog of proposed projects provides a hedge against a serious let-down.

What happened, therefore, is more than normally indicative of what's ahead, so that, in broad outline, these things may be expected as 1952 unfolds:

(1) Construction volume will come close to maintaining 1951's record-breaking pace, with the indicated drop-off not exceeding 10%. (2) Materials, except critical metals, will be in good supply. (3) Enough labor will be found to man all jobs, although some of it may have to migrate. (4) Equipment makers will manage to meet all demands. (5) Costs will move in a range within about 3% of present levels. Borrowed money will be dearer, but there will be plenty of it. (6) Industrial buildings and airports will offer the largest volume of work, relative to their normal levels. (7) Highways, despite shortages in steel, will be built in 10 to 15% greater volume than last year. (8) Housing will be below record levels, but not bad. Commercial building will be bad, waterworks and sewage facilities a little lower than last year.

As to technical developments, these may be expected: Increased interest in prestressed and precast concrete and in welding as steel-savers; more fluoridation of water supplies; stepped-up activity in phenol waste treatment and in sewage sludge concentration without digestion; improvements in airfield surfacing to resist effects of jet planes; and attempts to incorporate more bomb resistance in structures.

For the basis of these predictions and the background for others, turn to the page where the first of the special sections listed below begins.

Construction Business Outlook

Four articles, beginning on .... p. 53
Where the money comes from .... p. 63

Raising Our Capacity to Produce

Three articles, beginning on .... p. 68

Techniques, Trends and Major Projects

Building and Housing .... p. 81
Transportation .... p. 99
Water Supply, Sanitation .... p. 122
River Development .... p. 138

FOR INDUSTRIAL PLANTS...
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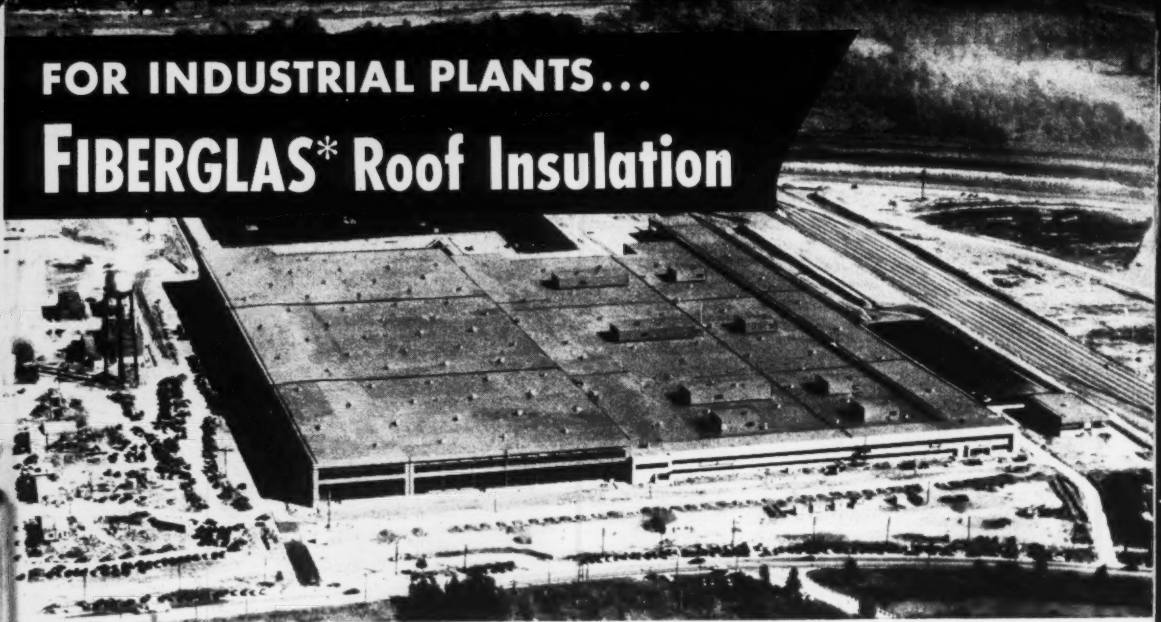

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Architect: Albert Kahn Associates........................Detroit

General Contractors: Darin & Armstrong..................Detroit
Bryant & Detwiler Co................Detroit

Roofing Contractor: Arrow Sheet Metal Works, Inc..........Buffalo

Roof Deck: Steel Deck

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Thickness:	½"	¾"	1"	1¼"	1½"	2"
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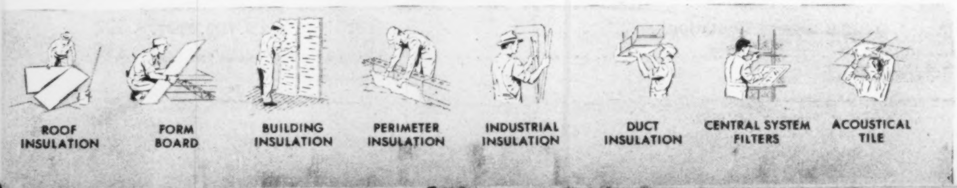
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INDUSTRIAL INSULATION
DUCT INSULATION
CENTRAL SYSTEM FILTERS
ACOUSTICAL TILE

ROOF INSULATION
FORM BOARD
DUCT INSULATION
ACOUSTICAL TILE

Construction Business Outlook . . .

- **Almost as good as 1951**
- **No question of capacity**
- **No shortage of labor, some of engineers**
- **Only metals are critically short**
- **There's more money than ever available**

The construction industry can look forward to another big year in 1952.

Because the emphasis of defense spending is shifting from construction to manufacturing total construction dollars spent in 1952 won't reach 1951's record-breaking levels—but they won't fall short by more than 10%.

The upward course of general business—rarely more definitely charted—gives force to such a prediction. Even by conservative estimates, the total volume of U.S. business is expected to be the highest on record. Gross National Product (total goods and services produced) will reach $342 billion or more in 1952. In physical terms—with price changes taken out—GNP will be just about double what it was in the boom year of 1929.

Construction will share in this prosperity, as it always has. In dollars, this share is estimated at $28.9 billion for new construction put in place, including oil and gas drilling. That will be down 7% from the corresponding estimate for 1951, and down 1% from 1950. Without oil and gas drilling, construction put in place reached almost $29.9 billion in 1951, up 7% from the $27.9 billion of 1950, according to estimates of the Department of Commerce.

These predictions are borne out by the contract award figures reported by ENGINEERING NEWS-RECORD, covering larger jobs of all types, including mass housing. New contract awards reported by ENR for 1951 topped $13.6 billion for such heavy construction—a rise of 10% from 1950. But ENR expects 1952 volume to be held by controls to the 1950 rate of $12.3 billion, about 10% below the 1951 record.

• Backlog swells—An indicator of the pent-up demand for construction is the fact that while controls (through credit and on materials) held contract lettings to $13.6 billion, new engineering construction projects were proposed during the year that would cost $16.75 billion. This pushes the backlog of proposed work up to a staggering $62 billion—highest it has ever reached. The increase, 19% in one year, is also the greatest since the postwar planning days of WW II.

• Long range—Construction's share of total business—10.5% in 1949, but down this year—is expected to start increasing again in 1953. (In 1952, the estimates would put construction's share of Gross National Product at 8.5%—by 1953 it may go up to 9%). By 1953, GNP is expected to level off as the defense program reaches its peak.

There is no question of the continuing huge need for construction: The backlog figures quoted above attest it; and U.S. population is up about 5,000,000 since the census was taken just 22 months ago. This alone means more billions of dollars in future construction of homes, highways, commercial and industrial buildings, schools, community facilities.

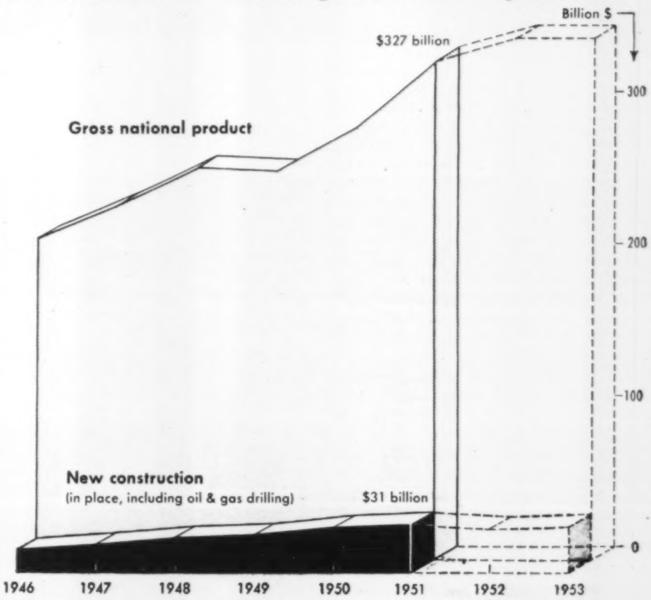
• Tough nut—The tough problem for construction in the year ahead will be to cope with the shortages of key metals, and the controls stemming from those shortages.

The industry won't be alone in its troubles, of course—automakers, television manufacturers and other metals-using industries will be in the same predicament to varying degrees.

But it is obvious that the heavy drain on metals supplies won't leave enough copper and structural steel to complete the defense program while still holding building at the record 1951 pace.

Most building products not made of metal will be in good supply. Fuller use of concrete and structural timber in place of structural steel, and substitutes for copper can be looked for. They could of course prevent a big part of the forecast cutback. Jobs where a minimum of steel will be used

Construction—6-10% of gross national product



U.S. Department of Commerce data. Estimates by McGraw-Hill Department of Economics. Chart by ENR Business News will be pushed ahead, many projects involving steel will be held up.

• Controls are kernel—The continuing and growing shortage of metals—has meant a stiffening of controls over the industry during the past year.

The basic new controls affecting construction were four, and of these, the most important was the Controlled Materials Plan. The others were: A flat ban on most commercial construction (ENR Jan.18, 1951, p23); a broadening of Regulation X to ease credit restrictions on housing loans; a relaxation of Regulation X for defense housing; and CPR 93—the Office of Price Stabilization's attempt to put construction under special price controls.

But it is CMP, with its tightening allocations of materials, with shifting requirements for reporting need and obtaining materials themselves, that is the key. CMP started (on June 21, 1951) for the construction industry with Regulation 6—itself the product of weeks of wrangling among the control agencies that were concerned.

Under Reg. 6, three basic policy decisions were set forth: Allotments of controlled materials would accompany authorizations to proceed with building plans; authorizations and allotments would be approved on a project-by-project basis; a lot of construction would be halted.

With Reg. 6 began the complicated process of making allotments for steel, copper and aluminum by obtaining production schedules from producers and attempting to mesh them with demand as reflected by government agencies acting as claimants for builders (and the claimant agencies had grown to 21 by early 1952). It is under this system that NPA has chopped so heavily into the construction business by cutting allotments for the second quarter of 1952, and forecasting cuts that will confine the industry's share of GNP for 1952 to about 8.5%.

The OPS attempt at putting construction under price controls was generally greeted with consternation and criticism—that it was unrealistic, would require enormous paperwork, would be unenforceable. Longer observation of its voluminous provisions, however, convinced the industry that the order (CPR 93) is in fact something of a farce, and in any case can be complied with.

The ban on commercial construction—actually an extension of the 1950 M-4 order which banned amusement construction— was in effect a prelude to the CMP regulation. It effectively slowed down such work until CMP's allocation machinery could finish the job (by the simple means of cutting allocations of metals to a point where these jobs would be impossible.)

The two credit actions were aimed at (1) maintaining some sort of a balance between rental and non-rental units (by lowering maximum permissible mortgages on single-family units; (2) stimulating home construction for workers attracted to defense industries and installations (by raising the maximum permissible mortgage in areas designated as defense areas).

Construction Business Outlook . . . . .

Volume demonstrates capacity

There was no question, as 1952 got under way, that construction had the capacity and organization to do any job set before it. The 1951 figures—which consisted largely of records—proved that.

Hammering away at one of the biggest jobs in its history—that of rebuilding a defense plant while providing facilities for a parallel civilian economy—construction hung up these records:

An all-time high in dollar volume of civil engineering contract awards at $13.6 billion, a thumping 10% above 1950's boom level. (This was no paper boom: Even with the air taken out of these inflated dollars, the 1951 contract award volume was 4% over 1950, and only 4½% under the peak war year of 1942);

An all-time high in contract awards for industrial construction—$4.12 billion, 145% over the previous record of $1.7 billion in 1950;

An airport program, at $791 million, 605% ahead of 1950 totals. Of the total, federal air bases in the United States got $628 million—an increase of 1330% over 1950.

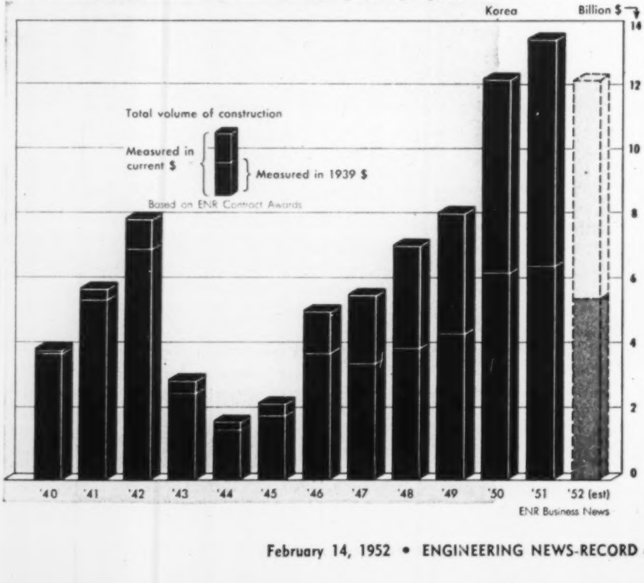
Unclassified work, at $1.6 billion, up 29% above 1950.

Still high, but no record (because of credit controls and materials restrictions) contracts for private mass housing at $2 billion were down 35% from 1950's record. Starts on housing units of all types, totalled 1,090,000, down 22% from the 1950 record.

And there were many others.

• Star of the show—The star of the

'51 is biggest year dollarwise for construction, but in deflated dollars '42 had higher physical volume



ENR Business News

$13.6 BILLION IN ENGINEERING CONSTRUCTION CONTRACTS AWARDED IN 1951

AS REPORTED TO ENGINEERING NEWS-RECORD

Covers construction projects of the following costs—waterworks, excavation and irrigation, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

Thousands of dollars (000 omitted).

	Public Works Contracts									Private Contracts							
						Buildings					Commercial Buildings		Construction				
States	Waterworks	Sewerage	Bridges†	Earthwork Irr.-Drain.	Streets and Roads	Residential	Other	Unclassified†	Federal Government Work	Industrial Buildings	Residential	Other	Private	Public	1951 Total 52 Weeks	1950 Total 52 Weeks	% Change '50–'51
UNITED STATES																	
1951	208,813	335,089	315,945	504,517	1,166,988	644,222	2,057,276	1,616,948	2,245,805	4,123,526	2,032,180	599,859	7,438,167	6,167,196	13,605,363	......	+ 10
1950	214,785	287,416	369,344	416,618	1,268,333	358,815	2,405,466	1,255,819	1,896,631	1,682,822	3,117,084	975,105	6,670,476	5,681,131	......	12,351,607	......
% Change	−3	+17	−14	+21	−8	+80	−14	+29	+18	+145	−35	−38	+12	+9	......	+10	......
NEW ENGLAND																	
Me.	......	1,097	919	217	7,649	......	9,447	38,212	39,754	2,750	......	......	8,750	51,541	60,291	15,521	+288
N. H.	105	......	341	......	5,530	......	458	167	215	650	300	700	1,650	6,601	8,251	10,464	− 21
Vt.	70	709	369	210	1,372	......	2,335	850	925	......	......	......	100	5,815	5,915	6,355	− 7
Mass.	5,926	3,781	27,464	1,349	16,570	54,042	140,174	16,054	87,154	51,445	17,053	23,840	92,589	265,109	357,698	253,341	+ 41
R. I.	1,239	4,885	249	1,708	3,305	10,598	2,587	5,822	7,982	23,941	1,100	6,735	31,921	30,248	62,169	42,833	+ 45
Conn.	746	7,724	2,570	355	10,092	12,267	37,159	1,284	1,570	27,926	24,043	5,445	57,414	72,197	129,611	168,664	− 23
1951	8,086	18,196	31,912	3,839	44,518	76,907	192,160	62,389	137,600	106,712	42,496	36,720	192,424	431,511	623,935	......	+ 25
1950	8,445	17,168	12,881	4,255	72,135	91,517	108,719	26,246	38,366	20,478	75,019	60,315	156,679	340,499	......	497,178	......
% Change	−4	+6	+148	−10	−38	−16	+77	+138	+259	+421	−43	−39	+23	+27	......	+25	......
MIDDLE ATLANTIC																	
N. Y.	7,432	15,156	20,548	4,472	33,178	50,696	142,925	53,731	64,169	138,296	312,685	47,133	502,114	324,138	826,252	1,025,149	− 19
N. J.	1,727	11,643	10,854	4,860	19,450	23,549	43,393	9,521	33,687	75,685	134,339	10,571	221,430	124,162	345,592	465,599	− 26
Pa.	5,458	20,278	9,587	18,622	74,300	34,820	64,160	38,200	50,783	502,411	218,119	43,021	777,770	251,206	1,028,976	902,673	+ 11
Md.	9,424	4,378	9,381	1,348	25,126	14,634	94,981	8,522	73,168	29,155	48,753	11,442	92,560	164,584	257,144	238,649	+ 8
D. C.	1,872	759	60	......	2,941	10,394	9,536	5,367	19,073	250	1,960	300	2,510	30,929	33,439	61,730	− 46
Del.	4,622	2,788	1,315	54	2,106	414	5,111	2,654	3,304	17,439	36,375	12,715	66,529	19,064	85,593	66,107	+ 29
1951	30,535	55,002	51,745	29,356	157,101	134,507	360,106	117,995	244,184	763,236	752,231	125,182	1,662,913	914,083	2,576,996	......	−7
1950	55,495	66,456	164,067	22,860	363,267	102,092	286,180	86,214	68,766	242,815	1,068,980	301,481	1,631,625	1,128,282	......	2,759,907	......
% Change	−45	−17	−68	+28	−57	+32	+26	+37	+255	+214	−30	−58	+2	−19	......	−7	......
SOUTH																	
Va.	5,321	9,510	6,015	4,525	28,687	25,711	63,327	41,719	78,550	9,500	6,645	9,200	26,196	187,139	213,335	177,123	+ 20
W. Va.	235	70	2,456	......	8,124	345	7,862	595	2,133	71,889	350	1,821	74,060	16,512	90,572	87,617	+ 3
N. C.	9,055	2,449	8,239	362	39,771	22,073	33,544	20,699	24,141	23,612	21,099	12,747	61,826	131,824	193,650	258,376	− 25
S. C.	1,540	4,998	1,793	1,599	18,400	11,034	8,986	21,718	19,351	26,298	49,301	2,477	84,911	63,233	148,144	341,287	− 57
Ga.	2,574	5,473	4,849	4,479	20,414	49,042	17,542	34,501	19,921	94,283	39,547	9,508	159,953	122,259	282,212	152,342	+ 85
Fla.	4,816	6,004	30,538	8,598	30,233	8,198	26,805	58,237	62,576	62,049	71,555	10,692	147,148	170,438	317,586	274,154	+ 16
Ala.	1,047	9,884	4,573	12,076	15,418	30,611	17,236	21,010	27,553	84,065	8,904	7,058	117,708	94,313	212,021	146,331	+ 45
Miss.	1,567	3,075	7,819	6,888	15,055	3,999	10,390	42,746	32,180	43,458	3,750	4,143	67,474	75,416	142,890	95,366	+ 50
La.	4,106	5,204	11,160	16,450	28,130	18,513	21,495	66,745	39,822	168,680	29,220	24,716	264,409	130,010	394,419	277,017	+ 42
Ky.	3,112	3,904	1,748	1,145	27,632	44,916	142,350	15,587	162,049	180,085	19,210	10,948	223,491	223,876	447,367	666,810	− 33
Tenn	8,618	5,292	2,292	2,198	20,250	30,690	138,187	33,004	126,865	30,300	26,770	17,362	86,006	232,227	318,233	181,937	+ 75
1951	41,991	55,863	81,482	58,320	252,114	245,132	487,724	356,561	595,141	794,219	276,351	110,672	1,313,182	1,447,247	2,760,429	......	+ 4
1950	36,702	38,316	78,157	80,418	245,429	75,940	1,004,696	189,056	933,548	424,434	369,172	115,980	1,039,328	1,618,972	......	2,658,300	......
% Change	+14	+46	+4	−27	+3	+223	−51	+89	−36	+87	−25	−5	+26	−11	......	+4	......
MIDDLE WEST																	
Ohio	13,419	11,520	3,644	1,352	45,752	1,860	77,075	20,356	64,600	221,735	70,777	34,577	328,650	173,517	502,167	594,004	− 15
Ind.	6,370	6,487	2,607	1,478	22,048	804	66,820	23,208	50,366	166,880	26,516	20,618	232,941	110,895	343,836	211,665	+ 62
Ill.	4,935	41,882	14,463	6,337	51,862	34,666	85,476	62,049	51,817	336,204	118,754	41,343	521,781	276,190	797,971	624,727	+ 28
Wis.	3,784	6,468	4,489	242	31,306	591	21,279	7,103	4,790	46,507	1,913	6,818	59,123	71,277	130,400	162,464	− 20
Mich.	11,020	17,864	7,987	387	39,319	11,921	104,584	21,024	39,332	229,748	139,280	24,080	405,944	201,270	607,214	251,922	+141
1951	39,528	84,221	33,190	9,796	190,287	49,842	355,234	133,740	210,905	1,001,074	357,240	127,436	1,548,439	833,149	2,381,588	......	+ 29
1950	24,799	50,694	32,906	16,841	136,633	31,212	205,274	146,701	70,885	556,410	483,875	159,437	1,314,343	530,439	......	1,844,782	......
% Change	+59	+66	+1	−42	+39	+60	+73	−9	+198	+80	−26	−20	+18	+57	......	+29	......
WEST OF MISSISSIPPI																	
Minn.	2,037	4,402	3,373	3,779	34,382	5,839	31,905	13,937	9,658	144,037	1,000	9,635	160,310	94,016	254,326	169,758	+ 50
Iowa	1,092	1,644	12,998	2,355	49,026	1,685	11,938	17,501	1,958	16,668	8,175	7,046	47,630	82,498	130,128	111,220	+ 71
Mo.	2,406	3,522	10,528	11,198	26,492	2,265	10,414	40,808	21,361	148,613	59,360	20,795	267,088	69,313	336,401	334,382	+ 1
Ark.	723	3,804	1,006	8,014	13,173	5,910	7,158	25,305	11,598	70,933	10,418	8,428	111,104	43,768	154,872	133,226	+ 16
N. D.	1,135	1,614	3,884	20,429	9,809	......	2,263	7,663	28,637	10,444	......	861	13,402	44,700	58,102	63,661	− 9
S. D.	951	848	6,815	46,407	12,177	......	599	29,312	76,556	562	372	2,774	10,153	90,664	100,817	44,259	+128
Neb.	902	451	4,440	4,079	13,376	7,188	13,600	21,502	8,209	4,202	8,447	300	28,342	50,145	78,487	93,234	− 16
Kan.	844	3,846	3,013	5,549	19,780	619	30,535	44,316	36,114	22,179	56,804	3,571	100,648	90,408	191,056	146,693	+ 30
Okla.	3,028	6,146	6,063	4,179	42,518	844	13,241	24,405	10,246	20,602	700	6,235	43,685	84,276	127,961	164,907	− 22
Tex.	37,152	43,944	12,183	29,171	97,745	61,727	97,428	295,062	137,273	619,526	216,034	65,723	1,089,470	486,225	1,575,695	1,353,110	+ 16
Mont.	263	11	1,559	1,335	15,694	470	3,541	10,065	14,297	3,790	6,572	......	13,168	30,132	43,300	45,886	− 6
Wyo.	312	458	1,212	5,110	8,656	......	1,926	13,067	10,745	647	325	......	10,880	20,833	31,713	47,542	− 33
Colo.	8,420	2,329	601	19,338	13,298	3,235	77,767	11,726	85,883	20,141	28,588	2,778	55,639	132,582	188,221	63,006	+199
N. M.	270	1,479	62	1,740	11,144	2,757	31,579	26,821	41,159	304	......	3,274	19,010	60,420	79,430	120,454	− 34
1951	59,535	74,498	67,737	162,683	367,270	92,539	333,894	581,490	493,694	1,082,648	396,795	131,420	1,970,529	1,379,980	3,350,509	......	+ 16
1950	66,215	60,639	47,541	145,792	319,730	43,212	335,130	633,042	307,670	342,899	655,782	241,356	1,800,107	1,091,231	......	2,891,338	......
% Change	−10	+23	+42	+12	+15	+114	−0.4	−8	+60	+216	−39	−46	+9	+26	......	+16	......
FAR WEST																	
Idaho	244	293	1,736	11,746	5,630	......	2,347	42,872	17,574	8,461	......	375	9,075	24,629	33,704	71,830	− 53
Utah	713	111	412	......	8,677	4,415	19,941	5,148	23,735	14,493	13,455	5,318	35,072	37,611	72,683	37,429	+ 94
Ariz.	399	831	555	8,184	10,952	2,538	3,436	20,202	20,225	8,500	5,250	4,813	27,562	38,098	65,660	54,648	+ 20
Nev.	334	1,764	62	662	4,761	......	6,006	4,244	9,891	51,582	......	......	52,249	17,166	69,415	9,538	+628
Wash.	5,099	3,951	8,363	52,468	20,927	7,447	58,989	87,185	103,821	47,628	19,703	12,309	153,191	210,878	364,069	451,564	− 19
Ore.	2,696	4,996	7,053	91,006	27,001	404	8,966	12,037	104,905	5,449	800	3,481	13,106	150,783	163,889	131,840	+ 21
Calif.	19,653	35,363	31,698	76,457	77,750	30,491	228,473	193,085	284,130	239,524	167,859	42,133	460,425	682,061	1,142,486	943,253	+ 21
1951	29,138	47,309	49,879	240,523	155,698	45,295	328,158	364,773	564,281	375,637	207,067	68,429	750,680	1,161,226	1,911,906	......	+ 12
1950	23,129	54,143	33,792	146,452	131,139	14,842	465,467	174,560	477,396	95,786	464,256	96,536	728,394	971,708	......	1,700,102	......
% Change	+26	−13	+48	+64	+19	+205	−29	+109	+18	+292	−55	−29	+3	+20	......	+12	......
CANADA																	
1951	25,873	14,190	17,283	92,304	53,952	80,669	218,274	160,648	274,423	439,561	67,602	50,521	597,444	663,193	1,260,637	......	+ 69
1950	17,475	11,617	10,312	20,461	38,834	43,067	107,199	156,705	80,173	180,999	112,081	46,329	452,703	292,376	......	745,079	......
% Change	+48	+22	+68	+351	+39	+87	+104	+3	+242	+143	−40	+9	+32	+127	......	+69	......

† Incl. private   Bridges, public $304,155 ('51), $358,734 ('50), private $11,790 ('51), $10,610 ('50)   Unclassified, public $946,136 ('51), $370,964 ('50), private, $670,812 ('51),
$884,855 ('50)

$62 BILLION IN BACKLOG OF PROPOSED ENGINEERING CONSTRUCTION, DECEMBER 31, 1951

AS REPORTED TO ENGINEERING NEWS-RECORD

Covers proposed construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000

Table is in thousands of dollars (000 omitted)

Total projects proposed during 1951............$16,754,889,000
Net increase in backlog during 1951............10,033,723,000
Projects removed from backlog when put under construction contract $6,721,166,000

	Public Works Projects								Private Projects			Construction				
States	**Water-works**	**Sewer-age**	**Bridges†**	**Earth-work irr.-drain.**	**Streets and roads**	**Buildings incl. pub. housing**	**Unclassified**	**Federal government work**	**Industrial buildings**	**Commercial buildings & housing**	**Unclassified**	**Private**	**Public**	**1951 Total**	**1950 Total**	**% Change '50-'51**
								UNITED STATES								
1951......	**1.431.932**	**2.371.785**	**2.030.245**	**7.444.277**	**5.128.941**	**13.569.140**	**6.507.329**	**12.349.011**	**9.400.276**	**7.993.476**	**6.269.371**	**23.715.971**	**38.439.801**	**62,146.772**	....	**+19**
1950......	1,386,730	2,182,325	1,692,117	7,281,735	4,598,234	12,050,414	4,716,633	9,754,199	5,753,133	6,962,583	5,489,115	18,250,104	33,862,945	....	52,113,049	......
% Change.	+3	+9	+20	+2	+11	+13	+38	+27	+63	+15	+14	+30	+13	....	+19	......
								NEW ENGLAND								
Me.........	410	4,753	9,961	1,373	53,589	23,098	87,976	75,237	2,709	15,145	9,950	27,804	181,160	**208.964**	115,550	+81
N. H.......	3,217	5,052	37,341	1,051	13,818	32,967	64,477	61,677	7,012	17,120	54,687	78,819	157,923	**236.742**	133,199	+78
Vt.........	1,520	1,891	100	81,376	1,687	21,239	6,781	86,647	1,090	2,510	413	4,013	114,594	**118.607**	107,889	+10
Mass.......	41,762	66,671	67,953	31,315	49,912	585,132	198,663	256,268	56,799	153,796	109,028	319,623	1,041,498	**1.361.031**	1,102,013	+23
R. I.......	7,336	24,491	31,155	1,734	60,987	95,782	29,106	67,019	8,450	40,607	6,758	69,315	237,091	**306.406**	260,074	+18
Conn.......	16,515	30,681	32,251	82,898	91,547	305,695	47,816	128,501	309,913	147,435	22,696	480,274	607,173	**1.087.447**	776,271	+40
1951......	**70.760**	**133.539**	**178.761**	**199.747**	**271.540**	**1.063.913**	**434.819**	**675.349**	**385.973**	**376.613**	**203.532**	**979.848**	**2.339.349**	**3.319.197**	....	**+33**
1950......	69,519	127,736	139,696	200,353	234,130	943,175	230,821	517,421	105,065	321,386	120,115	563,296	1,931,700	....	2,494,996	......
% Change.	+2	+4	+28	−0.3	+16	+13	+88	+30	+267	+16	+69	+74	+21	....	+33	......
								MIDDLE ATLANTIC								
N. Y.......	239,087	371,998	252,082	98,506	725,882	2,330,676	1,294,267	323,670	436,693	1,219,949	140,027	1,802,669	5,306,498	**7.109.167**	6,487,205	+ 9
N. J.......	71,370	61,500	103,197	24,809	361,472	416,288	233,894	157,698	234,230	265,825	82,914	582,969	1,272,539	**1.855.499**	1,589,454	+17
Pa.........	79,574	185,208	168,825	236,570	659,386	740,529	389,303	439,364	536,156	792,612	149,982	1,483,549	2,454,596	**3.938.145**	3,282,881	+20
Md.........	38,909	23,774	16,691	11,496	280,191	340,014	91,999	249,703	157,494	173,260	77,253	408,007	802,074	**1.210.081**	1,002,779	+21
D. C.......	6,761	6,865	22,252	2,500	26,260	260,497	112,711	295,809	162	38,826	1,358	40,346	437,846	**478.192**	469,503	+ 2
Del........	885	11,345	6,829	302	22,256	44,783	31,164	31,695	23,076	64,764	35,167	123,007	117,564	**240.571**	174,194	+38
1951......	**436.586**	**660.690**	**569.876**	**374.183**	**2.075.447**	**4.132.787**	**2.152.338**	**1.500.939**	**1.387.811**	**2.555.236**	**486.701**	**4.440.547**	**10.391.108**	**14,831,655**	....	**+14**
1950......	444,319	645,103	459,490	352,166	1,782,020	3,931,752	1,873,443	1,135,624	1,151,969	1,922,468	443,286	3,520,232	9,485,784	....	13,006,016	......
% Change.	−2	+2	+24	+6	+16	+5	+15	+32	+20	+33	+10	+26	+9	....	+14	......
								SOUTH								
Va.........	7,801	45,529	25,227	76,636	67,343	151,947	124,992	219,585	121,284	27,958	99,891	249,133	499,385	**748.518**	574,861	+30
W. Va......	2,307	27,495	5,901	25,509	2,483	89,168	31,332	68,480	65,747	10,409	36,606	112,937	183,990	**296.927**	200,270	+48
N. C.......	19,418	22,822	7,755	201,098	13,485	125,611	32,396	253,072	133,857	70,693	87,055	291,883	422,307	**714.190**	604,123	+18
S. C.......	14,840	11,673	9,479	102,199	15,075	95,312	168,996	277,437	155,147	31,044	40,010	229,201	417,574	**646.775**	384,609	+68
Ga.........	21,168	22,126	17,675	16,521	18,459	178,700	11,532	61,969	74,224	59,972	54,989	189,685	285,681	**475.366**	466,573	+ 2
Fla........	26,017	57,653	29,062	61,757	33,976	176,013	199,948	237,840	92,183	220,648	89,661	402,492	584,126	**986.918**	925,446	+ 7
Ala........	6,102	16,307	10,721	59,510	35,301	178,989	23,910	160,735	66,787	31,025	69,332	167,144	330,840	**497.984**	409,528	+22
Miss.......	9,722	12,757	1,411	29,244	8,647	96,163	41,838	75,078	50,684	21,445	215,257	287,386	199,782	**487.168**	447,021	+ 9
La.........	20,631	26,961	78,713	119,883	20,842	167,024	72,930	159,751	293,741	58,899	271,191	624,630	596,185	**1.130.815**	838,982	+35
Ky.........	10,849	29,001	13,697	118	2,490	146,938	16,813	84,599	124,568	47,013	64,219	235,800	219,906	**455.706**	310,344	+47
Tenn.......	9,937	46,684	21,670	66,877	27,052	320,587	79,229	273,564	173,109	110,428	66,971	350,601	571,943	**922.544**	736,713	+25
1951......	**148.792**	**319.008**	**221.311**	**759.352**	**245.153**	**1.726.452**	**803.796**	**1.872.110**	**1.351.331**	**692.534**	**1.095.182**	**3.140.892**	**4.222.019**	**7.362.911**	....	**+25**
1950......	127,964	302,148	182,265	825,945	226,909	1,444,021	466,199	1,420,026	671,818	669,484	981,717	2,327,968	3,570,592	....	5,898,470	......
% Change.	+16	+5	+21	−8	+8	+19	+72	+32	+101	+3	+11	+35	+18	....	+25	......
								MIDDLE WEST								
Ohio......	74,554	197,476	188,693	57,422	499,479	643,763	170,043	147,795	760,195	435,546	344,410	1,545,196	1,826,385	**3.371.581**	2,560,057	+32
Ind........	18,955	73,300	64,478	44,371	65,209	224,460	44,912	75,119	469,374	136,328	112,567	718,709	535,245	**1.253.954**	1,074,443	+17
Ill.........	129,385	157,109	128,118	206,048	400,713	657,127	251,195	277,362	816,949	387,269	189,302	1,401,882	1,921,333	**3.323.215**	2,623,663	+28
Wis........	4,535	18,934	27,457	855	47,019	145,498	18,835	24,095	171,010	76,879	27,445	275,334	263,133	**538.467**	495,514	+ 9
Mich.......	43,464	169,903	153,532	34,115	135,209	706,714	247,672	129,965	323,681	152,684	141,279	617,644	1,490,609	**2.108.253**	1,677,266	+26
1951......	**270.893**	**616.722**	**562.278**	**342.811**	**1.147.629**	**2.377.562**	**732.657**	**654.336**	**2.541.209**	**1.188.706**	**815.003**	**4.558.765**	**6.036.705**	**10,595,470**	....	**+26**
1950......	269,078	541,121	484,509	322,258	890,813	2,188,973	616,025	464,100	1,386,513	998,565	733,088	3,132,513	5,298,430	....	8,430,943	......
% Change.	+1	+14	+16	+6	+29	+9	+19	+41	+83	+19	+11	+45	+14	....	+26	......
								WEST OF MISSISSIPPI								
Minn.......	19,645	34,873	16,628	3,144	13,464	140,265	35,494	26,769	102,439	48,923	100,896	253,783	261,898	**515.681**	551,149	− 6
Iowa......	6,215	17,765	7,994	78,861	9,667	86,088	7,908	87,182	143,994	42,708	138,800	326,312	213,688	**540.000**	407,707	+32
Mo.........	17,668	64,212	56,875	162,999	293,523	429,772	111,921	406,128	120,828	177,197	232,319	533,413	1,133,901	**1.667.314**	1,518,699	+10
Ark........	18,995	25,593	30,160	251,276	34,325	130,220	37,945	295,566	298,363	22,134	180,313	501,025	528,299	**1.029.324**	778,151	+32
N. D.......	3,946	3,720	3,643	168,734	158	13,403	3,893	172,855	7,195	4,331	41,110	56,136	193,997	**250.133**	290,536	−14
S. D.......	2,700	1,935	480	191,234	2,456	9,462	22,655	214,984	1,190	9,837	34,458	45,485	230,922	**276.407**	276,375	+0.01
Neb........	88	17,289	9,148	148,255	2,924	158,959	66,726	236,704	24,532	30,786	71,773	127,091	403,389	**530.480**	439,930	+21
Kan........	10,756	11,694	13,017	151,214	6,658	155,534	79,227	267,799	184,278	33,730	220,138	438,146	428,100	**866.246**	661,977	+31
Okla.......	21,909	13,537	10,761	268,713	62,366	141,553	103,791	357,585	73,612	11,770	194,541	280,412	622,141	**902.553**	851,185	+ 6
Tex........	201,805	204,376	81,242	849,479	187,142	993,611	714,258	1,302,387	1,722,514	1,169,489	1,113,862	3,998,191	3,230,587	**7.228.778**	5,668,475	+28
Mont.......	5,502	5,419	67,019	252,943	23,072	51,549	25,278	271,339	88,875	15,001	12,880	116,756	430,782	**547.538**	477,679	+15
Wyo........	3,051	2,446	857	198,078	221	20,483	11,685	211,954	46,393	7,767	47,663	101,823	236,821	**338.644**	285,892	+18
Colo.......	35,353	10,999	6,953	321,927	78,560	103,965	49,336	402,853	62,279	55,952	137,471	255,702	607,093	**862.795**	792,952	+ 9
N. M.......	4,360	6,079	1,497	49,151	653	68,341	74,390	155,649	26,680	25,166	139,912	191,808	204,421	**396.229**	293,866	+35
1951......	**351.993**	**419.937**	**306.274**	**3.096.008**	**715.189**	**2 503.205**	**1.344.417**	**4.409.754**	**2.903.172**	**1.645.791**	**2.666.136**	**7.226.083**	**8.726.039**	**15,952,122**	....	**+20**
1950......	335,870	341,599	278,859	2,999,675	784,484	2,002,122	633,490	3,315,236	1,881,211	1,646,432	2,390,831	5,926,909	7,367,664	....	13,294,573	......
% Change.	+5	+23	+10	+3	−9	+25	+112	+33	+54	−0.03	+11	+22	+18	....	+20	......
								FAR WEST								
Idaho......	3,100	5,895	2,961	159,082	37,525	105,252	31,215	260,241	11,732	15,787	186,427	213,946	345,030	**558.976**	584,797	− 4
Utah......	7,722	12,171	1,869	135,888	24,405	43,699	15,496	153,490	20,786	24,087	61,477	106,350	241,250	**347.600**	340,161	+ 2
Ariz........	7,254	4,739	...	584,151	8,387	26,444	52,840	629,809	49,111	46,755	91,307	187,173	683,815	**870.988**	767,579	+13
Nev........	763	1,945	4,570	36,677	31,077	19,805	7,809	26,445	18,500	13,470	12,203	44,173	102,646	**146.819**	136,577	+ 7
Wash.......	47,965	30,763	87,526	723,859	228,652	356,317	232,722	946,459	214,637	178,501	92,954	486,862	1,707,034	**2.193.896**	1,617,687	+36
Ore........	7,250	13,224	20,063	175,394	45,224	67,537	19,954	209,349	70,675	44,242	104,117	219,034	348,646	**567.680**	556,009	+ 2
Calif.......	78,854	153,152	74,756	857,125	298,713	1,146,167	679,266	1,010,730	445,339	1,211,754	454,332	2,112,298	3,287,160	**5.399.458**	4,985,241	+ 8
1951......	**152.908**	**221.889**	**191.745**	**2.672.176**	**673.983**	**1,765,221**	**1.039.302**	**3.236.523**	**830.780**	**1.534.596**	**1.002.817**	**3.369.836**	**6.715.581**	**10,085,417**	....	**+12**
1950......	139,980	221,618	147,298	2,581,338	679,878	1,540,371	896,655	2,901,792	556,557	1,401,248	820,108	2,779,186	6,208,865	....	8,988,051	......
% Change.	+9	−1	+30	+3	−1	+14	+16	+11	+49	+9	+22	+21	+8	....	+12	......
								CANADA								
1951......	**189.440**	**234.765**	**323.589**	**574,852**	**1.505.282**	**1,633,867**	**1,180,220**	**573.618**	**1.728.363**	**785.180**	**2.465.563**	**4.979.380**	**5.641.741**	**10,621,121**	....	**+22**
1950......	188,338	223,891	311,995	629,162	1,399,355	1,503,651	1,132,044	408,105	1,031,159	717,923	1,540,491	3,289,847	5,388,162	....	8,678,009	......
% Change.	+1	+5	+4	−9	+7	+9	+4	+40	+68	+9	+60	+51	+5	....	+22	......

† Includes Private

1951 show had to be industrial construction, under the spur of defense activity and aided by the government financially—mainly by the inducement of quick tax write-off, but also (to a small extent) by direct loans to industry. A study of plant expansion, industry by industry, in the accompanying table, quickly shows construction's part in building the present defense machine.

Biggest in dollar volume were the process industries, with contract awards recorded by ENR of $1.5 billion, up 185% above 1950. Public utilities (see also p. 68 this issue) were still trying to catch up with postwar demands for power when they were hit with huge new defense needs. They awarded contracts for $737.5 million during the year—up 213% over 1950.

Metal refining and rolling plant also climbed to new highs in 1951. Awards in this field soared to $862.9 million, 368% above 1950's $184.4 million, and out of sight of the $35 million awarded in 1949. Machinery and machine parts manufacturers awarded contracts for $492.4 million in 1951, 186% more than they did in 1950.

Plant expansion for aircraft factories added up to $188.5 million for the year, 23 times greater than the contract total for 1950. The Atomic Energy Commission—though far under the $1 billion rate of 1950—weighed in with $581.7 million in contract awards.

Private engineering construction as a whole was 12% higher in 1951.

• Public works—Public works of all classes increased 9% to $6.17 billion, second in volume only to 1942. Federal construction went up 18% to $2.25 billion and state and municipal improvements, with a contract cost of $3.92 billion, were up 3½%.

Unclassified public works, mainly airbases, increased 155%, to $946 million. Full details on this are given in the accompanying table.

Public housing soared 80%, to $644 million. Private housing went down 35% from 1950 totals.

Earthwork, reclamation and waterways awards were up 21% to $505 million; sewerage was up 17% to $335 million, an all-time record.

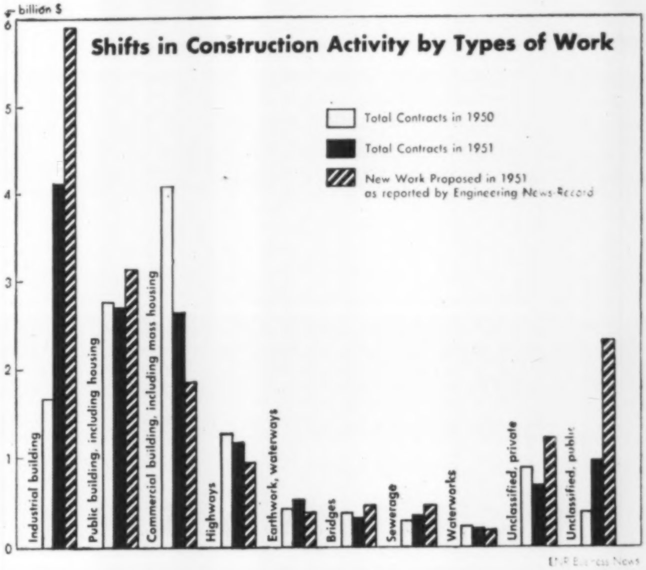
On the down side, in public works, were: Waterworks, with a total of $209 million, 3% under 1950; highways and bridges, at $1.5 billion, down 9%; non-residential public buildings, at $2.1 billion, down 14%.

• Big construction need—If there was little doubt as to construction's capacity to produce, there was even less doubt of the continuing need for a high volume of it.

ENR's measured backlog alone records $62 billion in known proposed projects. The accompanying table shows where these projects are and what classes of improvements they will be. (p. 61).

Note that industrial building proposed for future construction now tops $9.4 billion. The fact that this backlog increased 63% in 1951 (during the year when other industrial buildings went under construction at the highest rate in history) indicates construction at a record pace.

Certificates of necessity permitting fast writeoffs for tax purposes have been a primary factor in speeding up this industrial construction. Through Dec. 21, certificates had been issued covering plant and equipment having total value of $11.5 billion. Additional applications outstanding and not yet certified total $15 billion.



PLANT EXPANSION BY INDUSTRIES

Industry	1949 No.	1949 Value	1950 No.	1950 Value	1951 No.	1951 Value
Transportation Service						
Railroad	39	$10,761,000	56	$20,525,000	54	$21,515,000
Automotive	272	31,449,000	274	45,231,000	211	43,227,000
Public Utilities	110	235,380,000	111	235,793,000	126	737,493,000
Process Industries[1]	369	276,715,000	541	507,765,000	651	1,450,297,000
Food Industries[2]	394	99,639,000	470	147,273,000	286	80,798,000
Metal Refining & Rolling	20	35,087,000	40	184,457,000	76	862,935,000
Metal Working Plants						
Auto Factories	15	33,701,000	23	130,545,000	24	74,645,000
Aircraft Factories	5	966,000	12	5,106,000	45	118,492,000
Foundries	13	2,355,000	22	18,017,000	28	5,396,000
Mach. & Mach. Parts	219	87,923,060	385	172,363,000	586	492,440,000
Radio & TV & Electronics	6	1,308,000	12	6,310,000	27	62,451,000
Textiles (excl. rayon)	77	13,843,000	88	38,134,000	79	28,873,000
Wood Industries	40	4,963,000	56	11,298,000	47	8,963,000
Miscellaneous						
General Factories	580	113,028,000	832	156,530,000	687	133,663,000
Refriger. & Cold Storage	15	2,859,000	12	3,475,000	10	2,338,000
Total, priv. financed	**2,174**	**$949,977,000**	**2,934**	**$1,682,822,000**	**2,937**	**$4,123,526,000**
Fed. Owned Indus. Plts.	....	$247,147,000	....	$1,081,930,000	....	$581,741,000

[1] Includes distilleries

[2] includes breweries, frozen food plants and lockers.

UNCLASSIFIED CONSTRUCTION — PRIVATE & PUBLIC

	1949	1950	1951
Private			
Transmission Lines	$128,296,000	$107,552,000	$74,224,000
Pipe Lines	233,710,000	601,155,000	365,226,000
Railroads	15,655,000	26,539,000	47,250,000
Telephone	1,606,000	6,315,000	16,618,000
Drive-In Theatres	....	19,196,000	3,262,000
Radio	6,364,000	3,603,000	5,244,000
Airports	1,505,000	3,614,000	11,939,000
Other	107,397,000	116,881,000	147,049,000
Total Private	**494,533,000**	**884,855,000**	**670,812,000**
Public—Federal			
Airports, Airbases	6,637,000	7,149,000	234,103,000
Hangars, Buildings	17,119,000	28,172,000	183,024,000
Airport Housing	12,583,000	1,491,000	103,773,000
Airport Facil. & Util	8,666,000	7,302,000	106,683,000
Shipyards	160,000	1,730,000	12,601,000
Other	71,019,000	98,479,000	150,813,000
Total Federal	**116,184,000**	**144,323,000**	**790,997,000**
Public—State & Municipal			
Airports	59,379,000	64,432,000	51,423,000
Subways, Tunnels	19,333,000	21,349,000	11,402,000
Other	113,780,000	140,860,000	92,314,000
Total State & Mun	**192,492,000**	**226,641,000**	**155,139,000**
Total Unclassified	**$803,209,000**	**$1,255,819,000**	**$1,616,948,000**

MC GRAW-HILL's 1952 survey of industry's plans for investing in new plant and equipment comes as a third confirmation of this continuing activity. Companies reporting plan to lay out, in 1952, 13% more for capital goods than ever before in history.

• Highways up too—Private industry is not alone in big plans for this year. The state highway departments, whose plans were disrupted by steel shortages, last year, are shifting to jobs with low (or no) steel requirements this year, and are budgeting a 14% increase in the contracts they will let for new construction in 1952. New contracts totalling $1.4 billion are scheduled by the first 44 states with complete 1951-52 programs. Of these, 11 have smaller budgets than in 1951, the remaining 33 are above 1951 totals.

These figures do not include New York, which has been set back two months in its planning while projects are redesigned to make best use of available steel. But Governor Dewey is asking for a $125-million budget for regular state highway construction, and the state's Thruway program calls for $190.7 million in contracts during the year.

New York has changed its former policies to permit use of foreign steel to break bottlenecks on the Thruway bridge schedule. But Pennsylvania and Ohio reject foreign steel—Pennsylvania on the basis of price, $165 a ton, against $73 for the home product.

Construction Business Outlook . . . . .

What about supplies?

Key to the whole picture of construction's future in the next few difficult years is the matter of supplies—of Materials, Men, Machinery and Money.

Of these, materials shortages are of immediate concern, with technical manpower shortages a continuing threat to future expansion.

And there's one outstanding fact in the materials situation: Only the metals are critically short. For metals, construction must compete with defense needs. And it has had to give up more than any other industry except the auto industry. (For a more detailed discussion, see p. 77).

But most other construction materials producers worked below capacity in 1951, to serve an industry held down to the rate that the available metal supplies could sustain. This is notably true of those producers whose primary market is housing.

• Plenty of cement—Cement makers in 1951 again broke their own production and shipment records. The final 12-month figures aren't in yet, but when they are, they should show shipments topping 243 million barrels, for at least a 7% gain over 1950.

Estimated annual capacity went up to 272 million barrels, 5% more than in 1950 (this being a theoretical figure based on 365-day operation with no time out for maintenance). The number of producing plants was 154, up two from the fall of 1950.

Only a few spotty shortages developed, notably in Florida, western Pennsylvania, West Virginia and Tennessee. Through May, cement stocks remained below those for corresponding months of 1950, but from June on, stocks gained over the low 1950 reserves. Reserves should top 16 million barrels when the December figures are totaled up, to make a 3-million barrel, or 23%, increase in cement stocks on hand at the start of the new year.

• Fabricated shipments up — Steel shortage pains have diverted attention from the fact that fabricated structural steel shipments last year were 19% more than in 1950. The tonnage of backlog as the year closed was 23% higher than it was a year ago, as measured by the American Iron and Steel Institute.

Contracts closed for structural steel from January through May, 1951, ran 58% higher than in 1950. But during the next six months, the heavy impact of controls reduced the new contracts to 38% below the 1950 tonnage for the same period. The 1951 tonnages on record are: shipments, 2.7 million tons; contracts closed, 2.9 million tons; backlog, 2.67 million tons.

Reinforcing steel tonnage shipped through November is 1.7 million tons, according to AISI figures. This is an increase of 14% over 1950, and the full year should show shipments around 1.9 million tons for 13% rise for the year.

• Brick holds its own—Brick shipments almost held their own during the year, in spite of the forced drop in housing. Through November, they were running only 1% under 1950, and should complete the year with a total estimated at 6.3 billion.

Other materials records are:

• EXPLOSIVES shipments through November were 5% ahead of the previous year and previous records. (Mining and quarrying share the credit for this rise).

• LUMBER felt the impact of housing controls. Through November, shipments were running 5% behind the 1950 records. For the full year, they should top 37.7 billion board feet. Production gained 0.7% over the 11 months, should end the year at about 39.6 billion board feet. Unfilled orders stood at 1.8 billion board feet at the end of November, 22% lower than at the same time in 1950. This excess of production over shipments should ease the pressure on prices and help stabilize construction costs.

• SOFTWOOD PLYWOOD shipments increased 12% in the 11-month period for which reports are available. They should top 3 billion square feet (⅜" basis) for the year, for an overall gain of 11%. But interior plywood lagged a bit. Through November, 2 billion square feet were shipped, a 3% increase over 1950, and the year's total should hit around 2.2 billion. Plywood production in 1951 was just a shade higher than shipments. It topped 1950 production by 15% for the 11 months, with interior plywood production up 6% and exterior plywood up 48%.

• Index drops—Of the 20 building materials whose production fortunes are traced by the Department of Commerce, production was below the 1950 record rates on all but four in September and all but seven in November. Primarily, of course, these materials are selected for their importance to housing, hence the curbs in housing volume would cut back materials production where the industrial building boom could not absorb it.

Cement, fabricated structural steel, reinforcing steel bars, and gypsum board ran consistently higher in 1951, with mechanical stokers, rigid steel conduit and clay sewer pipe joining this parade late in the year.

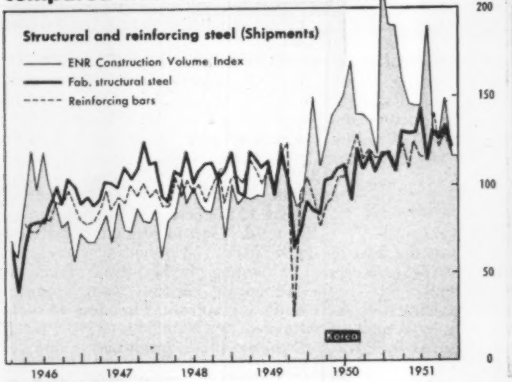
The composite index of production

MATERIALS SHIPMENTS — BY YEARS

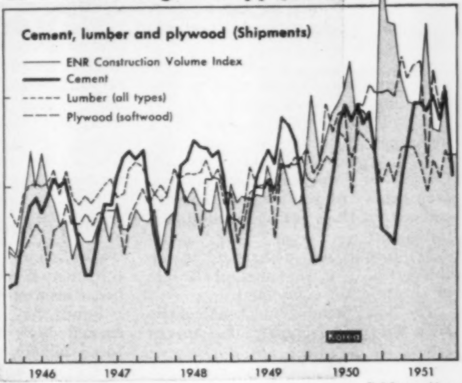
Item	Units, In Millions	1949	1950	1951 Est‡	% Chg
Cement, US Bu M	bbl	206.193	227.788	243.000	+ 7
Fabr struct steel, AISC	tons*	2.159	2.276	2.702**	+19
Reinf steel, AISI	tons	1.573	1.674	1.900	+13
Brick, US Bu C		5,252	6,348	6,300	− 1
Lumber, NLMA	bf	31,981	39,680	37,700	− 5
Plywood, US Bu C	sf, 3/8" basis	1,993	2,686	3,000	+11
Interior		1,595	2,120	2,180	+ 1
Exterior		398	565	820	+45
Explosives, US Bu M		597	707	740	+ 5

* series 1947 2,264,345† 1948 2,326,574† ** final, 12-mo report † unofficial-Est by ENR ‡ Estimates for year based on 11-mo reports

Steel shortage measured by shipments compared with construction volume



Other basic construction materials as a whole in good supply



ENR Business News

in all 20 materials stood at 159.1, (seasonally adjusted for November, 1939 = 100). This is 10% below the previous year

Main lesson from the index is that construction could not operate in 1951 up to the full capacity of most of its suppliers—because of metals shortages.

On manpower—it's a question

Divided into two parts—professional workers and labor (including skilled)—the manpower supply presents two aspects.

Speaking of labor alone, there doesn't seem to be any shortage in prospect. There will certainly be hardship and dislocation (as in such centers as New York City) but there is ample construction labor available.

A survey by Engineering News-Record of the 20 cities its reporters check each month for price and wage reports show none short of labor, and only one (New York) with what might be called an oversupply. Unemployment in these major centers undoubtedly will grow greater as the effects of cut down in commercial and other types of construction increase.

Without much question, the problem—and the hardships—for construction labor will come in the matter of moving to where the jobs are—such areas as Paducah, Ky., the AEC's big installation at Savannah River and the like.

This is no easy thing for the men involved. Although construction by its nature has always meant a migratory existence for many of its people, of late years improvements in technology that have made work possible through most of the year; and changes in pay status—such matters as growing pension and welfare funds—have militated against as much movement among men engaged in the industry.

And the very existence of such local inducements, plus the tightening in major centers, isn't making it easier for the men to move. New York's building trades leaders—with some 25,000 men already unemployed—have been sending scouts to other centers to attempt to find where their men can go. They are finding a good deal less than a cordial reception.

• Dangerous loss of efficiency—The real danger of such a forced shift of labor lies, however, in the loss of efficiency.

Many a contractor is today seeing his work crews—built up over long periods—drift apart and away to other areas. Just how tough it will be to re-assemble these crews, or ones like them, is the major problem for the future of the industry, once the current defense boom is over or levels out.

• Professionals another story—The matter of a continuing supply of professionally-trained men is another matter, and one of serious concern.

From a postwar peak of more than 50,000 engineering graduates (including all branches) the annual rate has dropped now to about 36,000. Of these, only about 14% are civil engineers.

The reasons are many. One of them is that there are (temporarily) fewer young people of college age. Another is that the returns—salary-wise—for the first years after a four-to-eight year training, are low ($250 to $325 a month) by current inflated standards. Many a bricklayer, laundry-truck route driver, salesman can look for a better income than that in his first years of work without nearly the preparation.

Another factor that has affected the supply of engineers is the drain on graduates by industry calling them to other lines of work. Industry has become increasingly aware that such trained men make good executives—their training in logic and in careful evaluation of circumstances lends itself very well to executive work.

Additionally, of course, the armed forces have taken their share both of newly-fledged college graduates and older men, as well as of men who have not yet entered the profession or training for it.

• Trouble is time—Obviously, the trouble with technical personnel is time.

The average civil engineering course takes four years—there is serious talk of extending the courses to six or more years. Granted that much of the "fat" that goes into a rounded college education could be cut out of a speeded up engineering course (as was done in many fields during the war) the fact still remains that years—not weeks or months—are involved in the business of turning out a competent engineer.

The machines are there

Heavily affected, of course, by the metals situation, and by a not-surprising lack of understanding on the part of government as to proper function and uses of construction machinery, the manufacturers are holding their own.

The manufacturers, indeed, are currently in the position of the rope in a tug-of-war. On the one end are continued cutbacks in the materials they need—on the other are the 21 claimant agencies, plus an increasing demand for machines for the military, plus military defense construction programs.

• **All but three**—Despite this two-way stretching, the manufacturers still feel they will be able to produce on a somewhat satisfactory basis—except for shovels, cranes and heavy tractors. Output of these big machines will drop below last year's figures, and the makers put three reasons behind that statement:

(1) Insufficient understanding on the part of CMP personnel of the role of construction equipment,

(2) Not enough "lead time" allowance for manufacturing the heavier types,

(3) Inequities between each machine and allotments for its spare parts and accessories.

• **Try at education**—Early in 1951, when lack of understanding between the manufacturers and the alphabetical agencies in Washington began to be apparent, the Construction Industry Manufacturers' Association started a program of education.

Through its members, CIMA sponsored a voluntary survey of materials requirements, and submitted figures based on the capacity of members' facilities. Later—when it became apparent that the end-use of the machinery was not appreciated, CIMA prepared a hasty—but well handled—brochure.

• **But the job was done**—While they were expending effort, time and money on the education of the controllers, the machinery manufacturers did a job in 1951—in spite of the shortages.

CONSTRUCTION MACHINERY SHIPMENTS —9 MONTHS

(for excavating and earth moving equipment)
millions, 000,000 omitted

	Nine Months 1950	Nine Months 1951	% change
Total, all types	$416.4	$549.0	+32
Power cranes and shovels	76.8	130.7	+70
Road constr and maint machry	86.3	112.0	+30
Constr machry, mtd on tract	42.8	47.6	+11
Tracklaying tractors	172.1	188.7	+10
Wheel tractors	17.2	37.2	+117
Trucks, tr-tract, off-hwy trailers	17.5	24.9	+42
Portable well drills	2.7	4.1	+50
Other excav & ea-mov equip	1.1	4.7	+324

U. S. Department of Commerce

DISTRIBUTION OF CONSTRUCTION MACHINES AS ESTIMATED BY CIMA

	Norm	Now	War
Construction			
Military combat	0.5	25	75
Military and defense	1.5	12	3
Highway construction	30.0	10	4
All other*	23.0	10	1
	55.0	57.	83
Mining and quarrying	20.0	18	9
Agriculture	10.0	10	4
Logging	5.0	5	1
Petroleum (Incl pipe laying)	5.0	5	1
Industrial (Incl mat'l handling)	5.0	5	2
	45.0	33	17

*Except oil pipeline and agriculture construction.

Some of the increases are fantastic, percentagewise—116% for wheel-type off-road tractors; 324% for "other excavating and earthmoving equipment"; 70% for cranes and shovels; 42% for trucks, truck tractors and trailers, off-highway type; 49% for portable well and blast-hole drills. (See accompanying tables.)

Plenty of money

The money supply was the least of construction's worries in 1951. Never has it been more plentiful.

Funds for heavy construction increased 73% in 1951, to a total of $15.5 billions, as measured by ENR. Corporate construction security sales soared to $3 billion, a rise of 18% over 1950, state and municipal bonds—sold to finance all types of construction except housing—tipped the sales of $2.5 billion, up 6% from a year ago. Sale of public housing bonds and notes climbed to $1.1 billion, up 43%.

Federal appropriations for the calendar year got heavy increases because of the overlapping of two extra big fiscal years (1950-51, 1951-52) with the result that construction money from this source went up to $8.2 billion—up 197% during the calendar year.

Federal aid to local agencies for highways, airports and hospitals went up 2%, to $532.5 million. Federal loans to industry for defense building added up to $196 million. Federal construction money should continue in good supply—evidence is in President Truman's new budget, which seeks 13% more construction money in fiscal '53 than was voted for fiscal year '52.

Counting both private financing and federal aid and loans, recorded funds for industrial building in 1951 totalled $3.2 billions—25% higher than in 1950; state and municipal funds, at $4.1 billion, were 13% higher than in 1950.

A rise in corporate securities financing is expected in 1952 to sustain the defense plant building program, since less money is available for this purpose from retained earnings.

These sources of construction money—that lend themselves to current statistical reporting—are of course only part of the picture. For others, see p. 63.

Construction Business Outlook . . .

Prices, wages, costs

Materials prices as a whole held at a 1% increase during 1951, while construction wages and fringe benefits increased a little over 5%. Direct construction costs went up about 3%. Contractors' firm bids or guaranteed prices, where the contractor took all the risks, went up as much as 7 to 17% to cover such intangibles as uncertainty about materials deliveries, controls and unforeseen delays.

Except for clay products, no major construction materials price rose more than 1.5% during 1951. But common brick prices increased 2.7%, according to ENR's 20-cities average, and structural clay tile prices were up 10.4% as the year ended.

Cement prices averaged 1.5% higher in the 20 cities, sand was up 1.3%, both fir and pine 2x4's were up 1.2%, and ready-mixed concrete was up 1.2%.

The structural steel price set in December, 1950, held through 1951.

The materials component in the ENR Construction Cost Index increased 1% from the first of January, 1951, to the same date in 1952.

The same pattern of stable prices appeared in the Bureau of Labor Statistics weekly wholesale price index for building materials, which was 0.8% higher at the end than at the beginning of the year. The monthly BLS wholesale price index increased 1.17%. Details are given in the accompanying table.

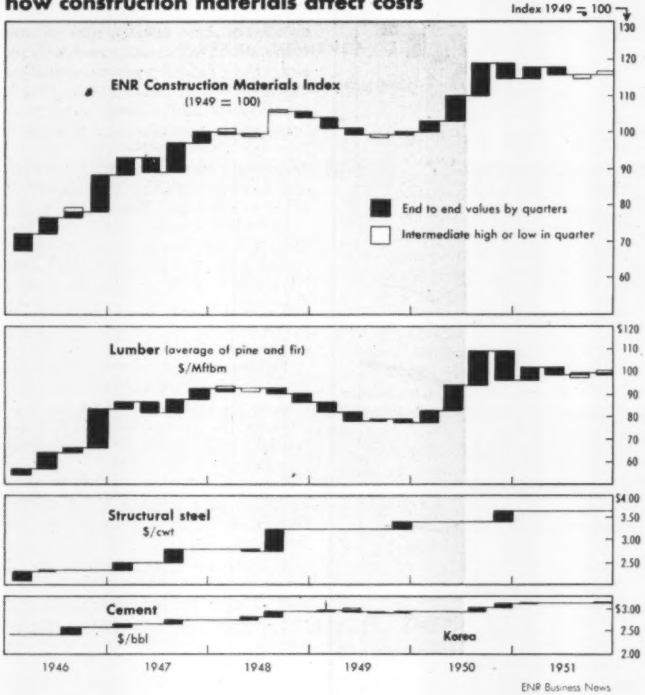
WHOLESALE PRICES OF BUILDING MATERIALS

U. S. Bureau of Labor Statistics
1926 = 100

	Dec. 1951	Dec. 1950	% change
Composite Index	224.0	221.4	+1.17
Brick and tile	179.5	179.1	+0.22
Cement	147.2	141.2	+4.24
Lumber	344.1	348.4	−1.24
Paint & paint mat'ls	164.1	154.9	+5.93
Prepared paint	154.4	147.3	+4.82
Paint materials	177.8	166.2	+6.98
Plumbing & heating	184.3	183.6	+0.38
Plumbing	137.3	139.3	−1.44
Structural steel	204.3	204.3	none
Other building mat'ls	198.1	193.8	+2.22

• **Wages**—Labor spent much of the year battling controls, and it was not until October that area wage rate agreements started coming through from the Wage Stabilization Board. It is also worth noting that while traditionally most construction wage contracts are settled in the second quarter of the year, last year the skilled

Price changes by quarters show how construction materials affect costs



wage agreements strung out through second, third and fourth quarters.

During the year, common labor wages climbed 4.3% in the 20-cities area, and skilled wages rose 5.9%. Bricklayers boosted their average by 6.4%; structural ironworkers by 5.7%, and carpenters, 5.3%. These increases included fringe benefits for welfare, pension and other funds.

As a contrast, union building trades wage rates (reported for 85 cities by BLS) advanced 4.5% without consideration of fringe benefits. Bricklayers averaged 5.9%, carpenters and electricians 4.1%, plumbers 3.8%, building laborers 3.7%, plasterers 2.8% and painters 6%.

As dollar wages have gone up for construction workers, so has cost of living. Even so, construction labor is still ahead. As shown on the accompanying chart, common labor's real wage is up 20% since January, 1946—while dollar wages rose 73%.

Skilled labor's real wages are 12½% higher than in January, 1946. During this period, dollar wages rose 73%.

Taking 1951 into consideration, the cost of living (measured by the BLS Consumers Price Index) increased 5.8%. This would indicate that in real wages, skilled workers broke about even last year, but common labor lost a little ground.

• Construction costs—The ENR Construction and Building Cost indexes increased only 3% during 1951. Other building cost indexes are up 1½% to 10%. Details are shown in accompanying tables, including also the ENR cost indexes for each of the 20 cities for which ENR has long reported price and wage figures.

The Bureau of Reclamation bid price index for dams and hydro-electric projects is 15% higher in January, 1952, than a year ago.

The Bureau of Public Roads composite mile price for the third quarter (based on contractor's low bids) was up 12½% from the year before and the California highway bid prices index went up 17% in the same period. But a lesser rise in the fourth quarter for the composite mile price puts it only 7% higher than for the same period of 1951.

Escalator clauses written into other contracts carried stoppers at 10% for the most part, but one is on record which used a 15% ceiling for the top cost rise that would be paid for.

Contractors' equipment prices went up 1.6% during the year as measured by the Marshall and Stevens index.

• Cost predictions—Construction costs should hold within a 3% range in the coming year. No sharp increases are expected. Labor will get increases proportioned to the rise in the consumers price index, steel prices

ENR COST INDEX REVIEW

Index Base,		1913 =100	1926 =100	1949 =100
CONSTR. COST	Jan '52	547.83	263.34	114.84
	Dec '51	547.67	263.26	114.81
	Nov '51	547.16	263.01	114.70
	Oct '51	546.51	262.71	114.56
	Sept '51	542.97	261.00	113.75
	Aug '51	542.86	260.95	113.78
	July '51	542.34	260.70	113.70
	June '51	542.77	260.91	113.76
	May '51	542.93	260.98	113.56
	Apr '51	539.97	259.56	112.93
	Mar '51	539.23	259.21	112.76
	Feb '51	538.00	258.62	112.52
	Jan '51	531.93	255.70	111.26
	Dec '50	530.03	254.79	110.84
BLDG. COST	Jan '52	405.62	219.26	115.30
	Dec '51	405.58	219.24	115.29
	Nov '51	404.50	218.66	114.98
	Oct '51	403.43	218.08	114.67
	Sept '51	400.26	216.37	113.66
	Aug '51	400.15	216.31	113.72
	July '51	400.34	216.41	113.81
	June '51	400.84	216.68	113.92
	May '51	401.10	216.82	113.67
	Apr '51	400.06	216.26	113.36
	Mar '51	399.32	215.86	113.13
	Feb '51	398.21	215.26	112.84
	Jan '51	392.99	212.44	111.37
	Dec '50	391.44	211.60	110.90

ENR COST INDEXES IN 21 CITIES
1913 = 100

In 21 cities 1913 = 100	Dec '50 Constr	Dec '50 Bldg	Dec '51 Constr	Dec '51 Bldg
Atlanta	289.79	338.65	394.85	350.88
Baltimore	473.99	386.56	512.74	412.56
Birmingham	413.49	345.00	416.21	352.51
Boston	562.95	391.90	587.64	409.54
Chicago	593.33	390.57	623.64	413.04
Cincinnati	552.80	392.04	548.04	401.30
Cleveland	587.25	387.88	626.03	403.17
Dallas	438.16	338.29	437.22	370.81
Denver	527.52	399.63	564.09	424.55
Detroit	591.98	400.02	601.05	412.51
Kansas City	569.69	405.51	585.99	416.75
Los Angeles	537.39	376.97	568.99	397.94
Minneapolis	561.75	412.63	592.35	437.71
New Orleans	438.07	375.89	434.86	379.18
New York	610.97	458.61	614.65	462.29
Philadelphia	574.78	448.63	582.38	461.20
Pittsburgh	528.77	397.36	556.93	416.33
St. Louis	569.07	420.62	586.78	427.39
San Francisco	519.29	388.79	527.30	378.76
Seattle	563.11	373.51	591.52	383.45
Montreal	427.19	344.76	483.73	384.56

OTHER BUILDING COST INDEXES

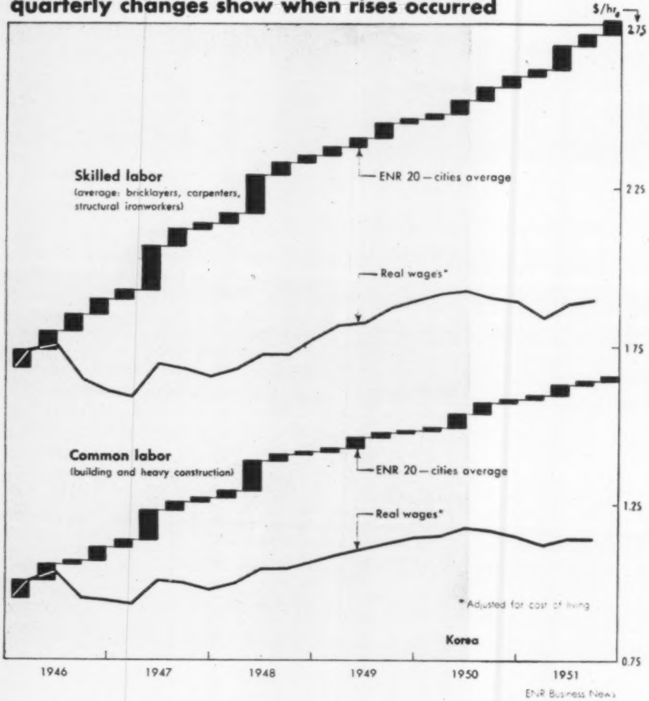
1913 = 100	1950	1951	
WEIGHTED	Dec	Sept	Dec
ENR Construction	530	543	548
ENR Building	391	400	405
American Appraisal*	517	536	539
Assoc. Gen. Contr	371	377	380
Boeckh, U. S. aver	402	418	....
Marshall & Stevens	415	428	430
Smith, Hinchman & Grylls*	457	476	487
CONTRACTOR			
Aberthaw	339	374	374
Austin	332	337	337
Fruin-Colnon	422	435	441
Fuller	398†	409#	415†
Turner	470**	485	485†

*Corrects for productivity
**February †January #October

BID PRICE INDEXES

	Jan '51	Jan '52
Bu. Recl. Dam & Hydro-power, 1940 = 1.0 ENR 11/1/51 p 129	2.00	2.30
	1950	1951
Bu. Pub. Rds, composite mile, 1925–29 = 100 3rd quarter	146.2	164.8
" " " 4th quarter	155.7	166.7
Calif. St. Highway, 1940 = 100, 3rd quarter	189.2	221.9

Construction wages gain on living cost..... quarterly changes show when rises occurred



ENR Business News

will probably go up—if the steel workers' demands for more wages are met.

No great changes should occur in lumber prices while production continues higher than shipments, and higher than new orders placed. Even the intangibles should be more predicable during the year, so that, together with closer bidding and keener competition, the bid price indexes should stabilize within a narrow range, it is indicated.

• **Financing**—New money for construction, except for state and municipal projects, cost more in 1951 than in any other year since WWII. And all owners of new construction—private corporations, states and municipalities and the federal government—face higher costs of financing in 1952. Bond yields and interest rates have been on the upgrade since Korea (except for state and municipal issues). They jumped sharply after the Federal Reserve withdrew its support of U. S. Government bonds last March.

Between December, 1950, and December, 1951, average yields rose 30% on the highest grade municipal bonds (Standard & Poor's A1) as they went from 16.2 to 2.10%. In four of the past 12 years, such yields have been lower, and in eight, higher.

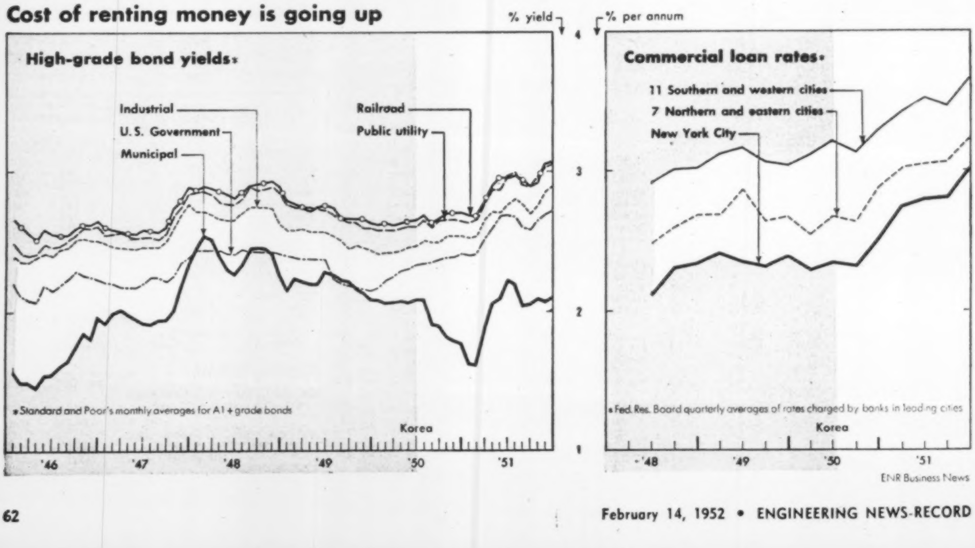
Yields on industrial and public utility bonds increased about 15%, from 2.53 to 2.88 and from 2.64 to 3.07, respectively. This is the highest "rental" paid on corporate construction money in 12 years.

Rates on commercial loans by New York City banks reached 3.01% by last December, compared to 2.51% in December, 1950.

So long as present high levels of demand for new money continue, the pool of new funds available will become smaller—in the sense that money will be in it, but for those who are willing to pay higher prices.

Pressure has been on, too, for higher mortgage rates. This has resulted in increasing difficulty in finding takers of mortgages at government-set GI rates of 4-4½%. This inability to get mortgage money at low rates prevailing up to last year is expected to help hold housing starts down where the control authorities would like them.

Cost of renting money is going up



ENR Business News

Where construction money comes from

• New reserves are piling up
• Yardsticks needed for measurement

The fact that larger supplies of construction money are available today than ever before (see also pp. 60) is no fleeting phenomenon that might disappear in the predictable future.

The sources are many, and some are relatively new. Two in particular are growing at fabulous rates: Insurance reserves and pension funds. One—retained earnings by corporations, although still large, shows signs of dwindling in the face of the government's increasing tax take. Even here, however, there is a counterbalancing effect, since large chunks of tax money find their way into public works.

But the outstanding point is this: To the main previous sources of construction money—private and public borrowing—have been added new and substantial flows of funds.

• Yardsticks needed—Yet, enormous as are these tributaries to the supply of construction money, no statistical instruments exist today to measure their full direct effect on new construction.

Some of the insurance and pension money buys corporate and municipal construction securities — and can thus be counted. But much still must be learned about the balance.

For public construction, taxes and imposts and service fees to retire revenue bonds provide more and more money. And direct appropriations out of income or reserves add to the total too.

It is a huge field to explore and chart in order to understand and measure all the tributaries. This article brings together the scattered pieces of what is now known. It should also direct attention to the additional knowledge that is needed.

One source: Insurance, pension funds

• Insurance and pension funds—Even to an industry accustomed to talking in big money figures, the ever-growing resources of insurance companies and pension funds are staggering: These two sources added $5.5 billion to the supply of new capital in 1951.

Total assets of insurance companies are currently growing by $4.5 billion a year (compared with less than $2 billion per year in 1940-41) and payments into trusteed pension funds (not including plans placed with insurance companies) are building up another pool of capital at the rate of $1 billion annually, according to estimates of the Bankers Trust Co. of New York.

The amount of funds actually available each year from these two sources is considerably greater than their net gain in assets, because of turnover in investments as loans are paid off and other holdings are liquidated.

• The lenders are eager—More than any other industry, construction has benefited from the eagerness of the insurance companies and pension funds to invest their money.

Statistics on the pension trust funds are not available, although it is known that the bulk of their investment money goes into the purchase of high grade corporate, state and municipal bonds.

Much more information is available on insurance companies. In 1951, for example, they increased their investments in mortgages, business loans and securities (included as "industrial and misc. bonds" in table), real estate and public utility bonds by more than $6 billion. A net decrease of $2.4 billion in U.S. government bond holdings made this record investment possible.

Nearly 50% of this increase was represented in non-farm mortgages for both residential and commercial buildings. Another 30% of the increase went into business loans and securities.

A substantial part of the business securities investment is in the form of term loans to business. (Perhaps the largest and longest-term loan of this type yet made was arranged last November for the Union Carbide & Carbon Corp., by the Prudential and Metropolitan Life Insurance companies. Each company agreed to advance $150 million on 100-year promissory notes as the money is needed up to November, 1954, for UC&C's expansion program).

Real estate investment by insurance companies totalled $1.7 billion at the end of 1951. Of this total, investments in apartment houses and in business properties acquired for lease-back purposes accounted for $1.2 billion, 20% more than a year earlier. (The remainder of the total went for insurance company purposes). Figures now available don't specify how much of this money went for new construction and how much for purchasing existing buildings.

• How they spend—An example of real estate investment by the insurance companies—and one of the biggest transactions of its kind—occurred in 1951, when the Equitable Life Assurance Society undertook to finance the redevelopment of Pittsburgh's famous "Triangle". This project will ultimately see the construction of nine office buildings to cost an estimated $100 million, the first phase, already in progress, consists of three new structures to cost from $35 to $50 million.

Another instance of lease-back construction by insurance groups is the Parkington, Va., shopping center project of the Mutual Life Insurance Co. of New York. Of the $9 million invested by the company, $5 million went for building a department store for lease-back, $3.1 million went for mortgage loans for perimeter retail stores, and $1.25 million for a parking building and parking facilities.

TOTAL ASSETS OF ALL LIFE INSURANCE COMPANIES DECEMBER 31st
(in billions of dollars)

	1940	1948	1949	1950	1951
Bonds—U. S. Government	$8.36	$16.75	$15.29	$13.46	$11.05
St., Co. & Mun		0.87	1.05	1.15	1.20
Other Government		1.47	1.47	1.45	1.53
Railroad		3.00	3.01	3.19	3.28
Public Utility		8.74	9.76	10.59	11.20
Industrial & Misc.		7.15	8.68	9.53	11.50
Stocks—Railroad	9.18	0.09	0.10	0.13	0.13
Public Utility		0.37	0.51	0.67	0.75
Other		0.96	1.10	1.30	1.48
Mortgages—Farm	5.96	0.99	1.14	1.33	1.53
Other		9.84	11.77	14.77	17.95
Real Estate	2.06	1.05	1.25	1.44	1.65
Other Admitted Assets	5.25	4.22	4.48	5.00	5.28
Total Admitted Assets	$30.80	$55.51	$59.63	$64.02	$68.50

Source: Institute of Life Insurance.

A variation of the lease-back arrangement was the issuance of Detroit revenue bonds to an insurance company, in exchange for construction of a new administration building to house city and county offices. Both city and county will pay rent, which will be used to amortize principal and pay interest on the bonds. On retirement of the bonds, title will pass to the city without further payment.

And of course, private business isn't the only prospect for lease-back arrangements. Examples of municipal lease-back include an incinerator for Santa Monica and off-street parking facilities for Culver City, Calif.

In addition to the lease-backs, other examples of insurance investment in construction include such developments as Stuyvesant Town, Peter Cooper Village, Fresh Meadow, Parkmerced and other large housing developments built, owned and leased by the insurance companies to individual residents.

Insurance companies also buy municipal securities and revenue bonds, as well as corporate securities, thus some insurance money is included in statistics measuring construction securities sales.

Source two: Retained earnings

CORPORATE EXPANSION—1946-50
(in billions)

	1946	1947	1948	1949	1950
Uses of funds					
Addition to plant and equipment, receivables and inventories	23.8	24.9	20.4	4.8	27.9
Sources of funds					
Retained earnings	8.1	12.0	13.6	9.7	13.6
Net Issues (net)	2.3	4.4	5.9	5.3	3.7
Other (Cash and Debts)	13.4	8.5	.9	−10.2	10.6

(Source: Barron's, Jan. 7, 1952)

• **Retained earnings**—Most of the money for the enormous private industrial plant expansion since the depression of the '30s has come out of retained earnings. And this source is the place from which has come most of the money to finance current plant expansion.

The statistics are sketchy (and mostly estimates).

Corporate expansion of all types was financed as shown in the table above, separate figures for construction not being available. Note that in 1950, only 13% of the money needed came from outside sources such as securities sales.

The extent to which manufacturing and public utility corporations are financing additional plant and equipment out of retained earnings and depreciation reserves is indicated by McGraw-Hill Publishing Company surveys and information supplied by the Edison Electric Institute.

Of all manufacturing companies responding to the McGraw-Hill surveys, 86% used only internal funds to pay for new plants in 1951. And in 1952 80% of those planning new construction intend to use only reserves and retained earnings.

Of the steel companies and chemical manufacturers—the industries that have sparked the current industrial boom (see also pp. 72 and 77)—91% reported that they financed all 1951 construction out of their own reserve capital. In 1950, 97% of chemical companies reporting, and 88% of steel producers used this method exclusively to pay for new construction.

• **Change due**—But things will be different in 1952 for these two major industries. Retained earnings have been greatly diminished by record expansion programs, and by taxes that take an even greater bite out of profits than in previous years.

Only 29% of the steel companies now expect to finance all their 1952 construction out of their own funds. Only 67% of chemical manufacturers expect to pay their own way.

Retained earnings have played an important—if lesser—role in the expansion of private electric utilities. Out of a total of $2.1 billion spent for new plant and equipment in 1951, $672 million, or 32%, came from reserves and retained earnings. Private electric utilities plan to spend $2.7 billion in 1952 and will draw 28% of it—$750 million—from their own funds to help foot the bill.

• **New finance pattern**—The tooling up for World War II, of course, was financed by the federal government, which retained ownership of the plants. That expansion followed on the heels of the depression when the supply of retained earnings was limited.

Today's defense construction situation is different. Industry has money in reserve and is finding it easy to get more.

To encourage the rapid flow of this money into new plants, the government pushed through new legislation to permit fast write-off of plant values for tax purposes. The certificates of necessity issued to permit these tax benefits apply only to facilities or that part of them directly applied to defense production. But to date $11.5 billion for plant and equipment has been so certified and $15 billion more is on application awaiting action by government authorities.

Some companies, even though they cannot apply the fast write off for tax purposes, have adopted as sound accounting and management policy the practice of stepping up depreciation and obsolescence charges in times of high earnings. This means faster generation of reserve funds which in their turn become available for plant construction and modernization.

Certificates of necessity carry with them eligibility for federal loans if private financing cannot be arranged. Only an insignificant amount, under $176 million, has come from this source. Another $21 million in RFC loans went to "small business" for plant construction.

Public funds

• **Public works**—State and municipal bonds backed by general taxes or special assessments were long the mainstay of local public works. But since legal ceilings were put over this source of construction money to limit government indebtedness, new wrinkles in direct imposts and revenue bonds became the style. More and more self liquidating projects are being financed this way.

The gas (or motor fuel) tax produces over $1¾ billions a year. State motor vehicle imposts produce another $1 billion. But of these combined funds only 78.5% is applied to construction and maintenance. Debt service on highway construction obligations takes 5.7%; highway policing and safety takes 2.7%; overhead and administration take 4.8% and outright diversion—for education, general funds and other non-highway uses—drains off 8.3%.

Revenue bonds added about $600 million ($533 million in 10 months) in 1951. This compares with $600 million in 1950 and $683 million in 1949. Each of these years represents a substantial growth from the $151 million in 1938 when revenue financing first made enough of an impact to be charted on its own.

State and municipal bonds amounting to \$2.5 billions in 1951 were sold to finance these types of construction:

	million
Waterworks & sewerage	\$520
Highways and bridges	615
Drainage & reclamation	13
Schools	875
Other public buildings except housing	216
Unclassified (airports, parking, gas supply power etc.)	254

In addition, public housing notes and bonds brought in \$1.1 billion during the year. Some of these notes were rotating, pending permanent bond financing. This is a relatively new demand on public financing, and a new type of bond was developed in 1951—a tax exempt municipal housing bond backed by federal government credit to keep the debt service cost low.

Along similar lines, New York State approved a constitutional amendment last year to permit state credit to back the revenue bonds that will finance its new \$550-million toll Thruway. This also is designed to produce lower debt service costs.

• Industry-attracting bonds—Still another development in state and municipal financing, is the recent wider use of municipal industrial bonds.

Aimed at attracting new industry, proceeds of the bond sale are used to construct new plant for lease to industry. These bonds may be backed directly by the credit of the municipality or they may be revenue bonds. Under the terms of the revenue industrial bonds, only the rent paid to the city or town may be used to pay the interest and reduce the principal.

Since both types have the tax exempt feature of regular municipals, they have so far found a ready market despite growing unwillingness of investment bankers to handle them. The bankers are alarmed at the dangers inherent in the linking of municipal obligations to the uncertainties and risks of private business. They also fear loss of the tax exemption feature of municipal bonds should the federal government decide that municipalities are taking undue advantage of that privilege.

• Not new—Industrial bonds however, are not new in the municipal bond field. As far back as 1936 Mississippi authorized municipalities to issue general obligation bonds for this purpose. Since then, Louisiana has also approved such issues.

The faster spreading type is the revenue bond, backed solely by the rental receipts. Kentucky, Alabama, Tennessee and Illinois legislation permits the sale of such bonds, and California is following suit.

Just recently bills were introduced both in Rhode Island and Massachusetts calling for creation of state agencies to purchase industrial sites and construct plants or rehabilitate old ones for lease to private industry. (ENR Jan. 17, 1952, p. 56) The distinguishing features of this proposal are that the issued bonds would not be tax exempt and that the financing would be at the state rather than at the municipal level.

An interesting example of industrial revenue bonds in 1951 was the approval of \$26 million for construction of three plants by Elizabethton, Tenn. Moreover, proposals for three more plants to cost about \$25 million are being considered by this town of 10,000 persons.

• Government appropriations and federal aid to local agencies provide another large source of funds. (See also p. 60). Federal funds requested in the President's budget for fiscal '53 add up to 7.7 billion for a 13% increase over the current fiscal year.

As to appropriations out of current income or reserves by local public works agencies, no means for measuring them now exists.

• Rental rates up—The huge supplies of construction money described here have come into the market when the cost of renting this money has been the lowest in recent history.

But interest rates have been going up since 1950, and the prospect for the immediate future is for still higher rental rates for the use of this money, for higher mortgage rates and for higher bond yields. These recent cost trends in money rates are also discussed with other construction costs in the accompanying Construction Business Outlook (p. 53).

Source four: Mortgages

Mortgage financing had another big year in 1951 as the stream of new housing continued to run strong, despite efforts to curb it. New apartment houses and commercial structures added still more to the demand for mortgage money.

Biggest single purchasers of mortgages in 1951 were insurance companies and savings and loans associations, which together provided more than \$10 billion in mortgage funds. The insurance companies spread their \$5 billion mortgage investment among new homes, apartment houses and commercial loans. Less than half—about 40 percent of their purchases represented home loans of \$20,000 or under, while savings and loans associations limited their investment of more than \$5 billion exclusively to this smaller type of home loan.

No data is available to measure the total mortgage financing by commercial banks and trust companies in 1951, but it is estimated that they invested \$3.2 billion in home mortgages alone. Another important source of mortgage funds, mutual savings banks, increased their mortgage holdings by \$1.7 billion in 1951.

The total volume of home loans in 1951, matched 1950's \$16 billion. These are of \$20,000-or-under reported by Federal Savings and Loan Insurance Corp.

Where did it come from?—According to data supplied by the United States Savings and Loan League, covering the first nine months of 1951, savings and loan associations purchased \$3.9 billion (32%) of the total \$12.2 billion in new home mortgages. Banks and trust companies bought \$2.6 billion (21%) and insurance companies took \$1.2 billion, or 10% of the total. Mutual savings banks provided only \$.7 billion (6%) of home mortgage funds, while the remaining 31 percent was taken up by individuals and other lenders. In the last group was FNMA, which used \$.5 billion of federal funds to purchase home mortgages.

The federal government did more than furnish mortgage money to aid home owners in 1951. The Veterans Administration insured \$3.5 billion of GI home loans during the year, and another \$1.9 billion of home mortgage insurance was underwritten by the FHA. In this way, \$5.4 billion, 33 percent of the new home loans made during 1951 was backed by the credit of the federal government.

The sharp cut-backs in residential and commercial building now in effect will prevent 1952 from equalling the mortgage financing record of 1951 or 1950. But this year may well reach the 1949 level when \$12 billion in new and non-farm mortgages of \$20,000 or under were recorded. An indication of the trend is a report of the Institute of Life Insurance setting advance commitments for home mortgages as of January 1 at \$1.1 billion, 33 percent below April of last year. In addition, it reports, new commitments are running \$.2 billion per month.

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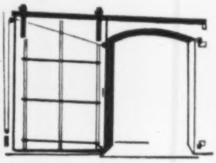
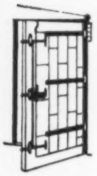
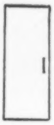
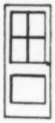
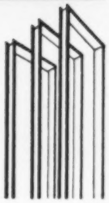

Underwriters' fire doors: metal clad; single-slide and double-slide


Underwriters' fire doors: metal clad; single-swing and double-swing


Kalamein doors: flush design or paneled; single or double-swing


Industrial steel doors: slide, single or double-swing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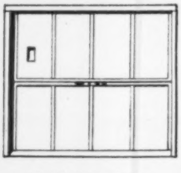
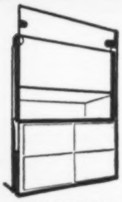
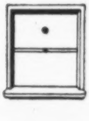
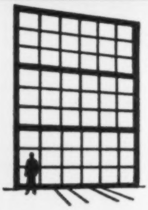

Freight elevator doors: motorized or manual

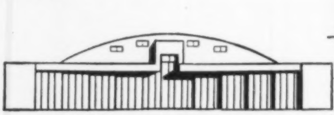

Motorized car gate

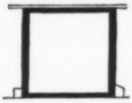

Dumbwaiter doors motorized or manual

The Peelle Company
BROOKLYN 37, NEW YORK

SPECIAL PURPOSE DOORS
motorized and manual


3 section vertical lift door, motorized, stainless steel and glass, 24 x 35 feet


10 section, horizontal slide, center parting, hangar door


Horizontal slide or swing jet test cell door

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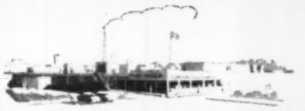
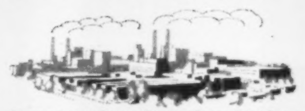


Aluminum Seal Company Building (Subsidiary, Aluminum Co. of America)
Richmond, Indiana Architects: Giffels & Vallet, Detroit, Mich.



Tennessee Eastman Company (Division of Eastman Kodak Company)
Kingsport, Tennessee

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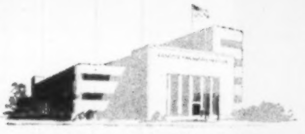
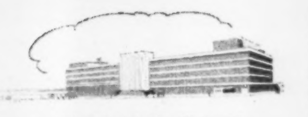
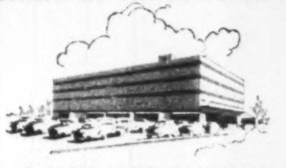


Colgate-Palmolive-Peet Building; Jeffersonville, Indiana
Albert Kahn Assoc. Arch's & Eng's, Inc.; Builders: Turner Construction Co.

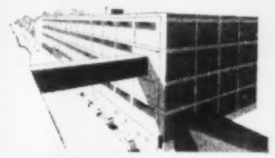


Abbott Laboratories, North Chicago, Illinois
Architects: Naess & Murphy Builders: John Griffiths & Son Constr. Co.

A FEW OF THE MANY FINE BUILDINGS THROUGHOUT THE COUNTRY IN WHICH PEELLE-RICHMOND DOORS ARE INSTALLED



Standard Oil Company #3 Barrel House; Whiting, Indiana
Engineers: Standard Oil Company; Builders: George A. Fuller Co.



U. S. Rubber Company Warehouse; Eau Claire, Wisconsin
Carl A. Ostling, Dir. of Engineering; Builders: George A. Fuller Co.

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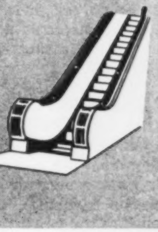
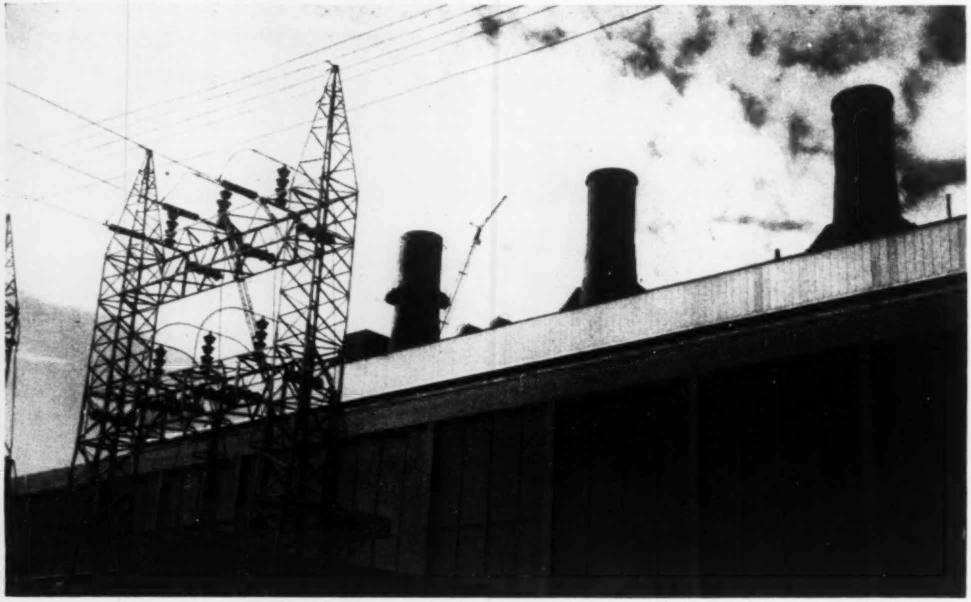




STEAM POWER is TVA's business now, as hydro was in World War II. Johnsonville plant above, will house 650,000 kw of capacity in the A-bomb and aluminum valley of Tennessee. Even if 75% of its cost were in equipment, it's still a lot of structure.

Raising our capacity to produce . . .

Kilowatts are the key

KEY to U. S. production capacity is the kilowatt. Underlying our capacity to produce anything else is our capacity to produce power. How are we doing in construction of plants to supply the demand for electricity of our expanding guns-and-butter economy?

In 1951 the electric light and power industry (private and public) put $3.15 billion into new capacity and installed 7,500,000 kw. But 8,000,000 kw of capacity had been scheduled for installation. And thereby hangs the tale.

Materials shortages are already hurting power-plant construction, and they are expected to hurt more in the next few years unless the power program is given a top materials priority along with military and atomic energy programs.

• **Scheduled, at least**—An estimated $3.79 billion has been budgeted for power expansion in 1952. Present schedules—government plants included—would boost total generating capability of the nation from the 78,500,000 kw it reached at the end of '51 by 9,000,000 kw in '52, 12,000,000 kw in '53 and 8,000,000 kw in '54.

This strenuous timetable would put the nation's total capability above 104 million kw by 1954—over twice what it was at the end of World War II. (And we're talking capability here, the realistic measure of ability to handle demand. This is not nameplate rating but actual ability to produce with the benefit of system interconnections included in the figures.)

If all units scheduled for construction in the years through '54 could be put on the line, if materials could be had for what the power people say is needed to meet estimated demands, the country would climb back to where it should be in terms of gross margin—capacity in excess of demand.

Gross margin ideally should be about 15% to meet minimum operating requirements, maintenance outages. Right now the figure is down to 7.8%. Scheduled installation would spread the margin to 8.8% during this year, 13.6% in '53 and 15.5% in '54, according to the Edison Electric Institute, figuring on median hydro conditions.

• **But**—Actually, just as construction for power fell at least half a million kilowatts short of its goal in 1951, EEI sees the materials situation taking further severe tolls this year and next.

Present indications are that inadequate allotments of steel, copper, aluminum and nickel will cut scheduled additions 25 to 50% this year. It is likely that 4,000,000 kw of capability scheduled for '52 just won't get on the line. And if it doesn't, gross margin will dip to an uncomfortable 3.7% in the face of a 2.5% growth in peak load anticipated for this year.

Losses of 4,000,000 kw in scheduled capacity are feared likely for 1953, too, in view of present materials difficulties. Such drastic cuts in scheduled construction could turn the present snug power situation into a real condition of shortages in a number of areas. Some go so far as to maintain that such a slippage behind present schedules would put

HYDRO FOR THE POWER-HUNGRY NORTHWEST will come from mammoth Hungry Horse Dam in Montana, already storing water for release to downstream power plants in the Columbia Valley. Two of its own 71,250-kw units will go on the line late this year. Power plant structure was changed to steel frame so work could speed up through last winter.

the U. S. in a situation that would take years to overcome.

• **Claimant outlook**—The Defense Electric Power Administration is claimant agency for some 4,000 electric utilities—public, private and cooperative. James F. Fairman, administrator of the one-year-old agency, foresees in 1952 "greater areas in which the power supply will be precarious."

He has stated recently that in 1951 new demand outstripped new capability—cutting into gross margin and causing serious local dislocations. In the Northwest, aluminum production suffered a three-week interruption; electric-furnace operation was curtailed several months in the Pittsburgh area.

Prospects, as Fairman sees them, are for tight power situations in '52 from the Great Lakes to the Gulf—especially in growing aluminum production areas of the South and Southwest. And improvement of conditions in the Northwest will have to await '54 and '55 completion of hydro projects under way.

Demand across the nation will grow this year at a record rate near 9,500,000 kw. It will be the job of the Defense Electric Power Administration to see if units can be put on the line to fill that need—and to put additional plants under construction for longer-range demand.

• **Ray of sunshine**—A recent report to the Defense Production Administration, by a special study committee it had set up, indicated that the power industry's estimates of future demand and schedules for filling it were possibly too conservative (ENR Jan 17, p 27).

DPA Administrator Manly Fleischmann had put a committee of utilities experts to check on Defense Electric Power Administration figures. Their belief that power expansion must exceed the claimant agency's estimates may have some effect on what controlled materials the industry manages to get this year and next. Their recommendations were definite: Give the power program its full material requirements. Cut back coastal utilities so that inland utilities can be built up. This latter recommendation is indicative of an effort to get defense industries off the coasts.

The committee pointed out that utility-company crystal gazers have no way of knowing exact future defense loads, and indicated that these will be larger than anticipated.

Another strong argument for easing up on materials to power-plant builders was the committee's observation that every **kilowatt is worth 100 times its weight in critical materials each year.** "One kilowatt of capacity can be fabricated and constructed with 1/100 as much (critical) materials as the same kw can supply the power to produce in one year."

Since the study committee made its report, a congressional "watchdog" committee on defense production gave the power program another boost, recommending a firm expansion program and allocation of materials to meet it. This group asked for an office of electric power right in DPA to bust materials bottlenecks.

• **If necessary, kw's stretch**—During World War II when the power producer's margin dwindled down to around 4%, there were real shortages in certain areas. Curtailments of power use were necessary.

But on the other hand, much was learned during World War II about how flexible existing power capacity can be. This learning has value now, in our present shift to short-of-war arms production.

This country did a 34,000,000-kw job with 10,400,000 kw the last time. That is, an indicated need for 34,000,000 kw of added power capacity at the start of the last war was cut by more than two-thirds, and the power producers still met demands.

How? By savings. Industry improved its load factor by working around the clock; daylight was extended by "war time"; capacity reserves were called in; line losses were cut; conservation measures paid off.

But that was in wartime. All-out effort was achievable; drastic measures were acceptable.

Today the problem is somewhat different. Expanding capacity to produce power parallels other expansion problems all along the line. The trick will be to build a power system to fill present demand and still keep it reasonably related to future peacetime needs.

This system must grow now to back unfailingly our present high rate of industrial production; construction for power must precede production with power; yet power expansion must not compete unfairly with other applicants for critical materials.

• Power from atoms—The dream of producing electrical energy from nuclear energy is one step nearer coming true. AEC has generated small amounts of power from heat released at an experimental breeder reactor. But the trick of converting nonfissionable material into fissionable material more rapidly than nuclear fuel is consumed has not yet been performed successfully.

Experiments at the Idaho breeder reactor were in no way intended to prove feasibility of producing electric power by atomic energy. The power test was incidental to other work. AEC does not yet know if it can "breed" fissionable material faster than it is consumed, making power production practical.

For the time being, our nuclear industry remains a No. 1 consumer, not yet a producer, of electrical energy.

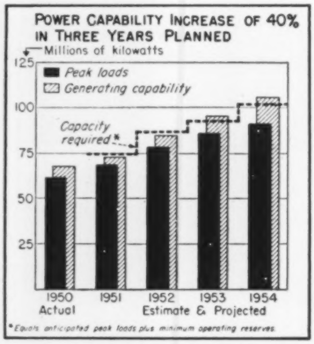
• Atoms and aluminum—Manufacturing schedules generally will suffer this year from materials shortages—not from power shortages. But there are two prime industries in which power figures as top priority need if planned production is to be met: atomic energy and aluminum.

The Tennessee Valley is a place where both figure heavily. And vigorous construction-for-power schedules are being met substantially despite the numerous and varied problems encountered in the obtaining of essential materials.

TVA is now all-out for defense with the Atomic Energy Commission and the Aluminum Company of America as its best customers for electric capacity now under construction. With its 19th and 20th dams under construction, Boone and Fort Patrick Henry in Northeast Tennessee, the authority has about run out of hydro sites. Damsites remaining are not of stature needed to meet present demand of the area (ENR June 22, 1950, p 124).

So steam plants—five big ones—are under construction by TVA with a total rated capacity of 2,790,000 kw. Steam, now producing only about 15% of TVA's total power capacity, will account for nearly 50% of it by 1954.

Johnsonville plant on Kentucky Lake in the middle of Tennessee and Widows Creek in Northeast Alabama will both be 675,000 kw plants. The former will have all its six units in operation in 1952; the latter will put four of six 112,500-kw units on the line this year.



OFFICIAL ESTIMATES—It is feared materials will not be allotted for construction to meet this estimated demand. Some say the estimates are too conservative. (Office of Defense Mobilization chart)

Shawnee plant, to feed AEC's Paducah, Ky., set-up about half the power it will need, and Kingston, near Knoxville, to supply Oak Ridge, were both begun in '51 with ultimate capacities of 540,000 kw. TVA's fifth new steam-electric station is Colbert in Northwest Alabama, two 180,000-kw units.

• Steam-power: Westward, Ho—What's happening in the Tennessee Valley, goes for the Far West, too. Economics of the power situation has shifted emphasis from water power to steam.

During 1951 Pacific Gas & Electric Co. added a third 110,000-kw unit to its Moss Landing Plant; brought in 340,000 kw at $80,000,000 Contra Costa plant; and planned a new steam plant for the Sacramento River delta area.

PG&E wants to put $132 million into electric-power construction this year.

Southern California Edison Co. plans, in the face of a 9% load increase, to build $80,000,000 worth of new plant this year.

Los Angeles Department of Water and Power put one of the West's largest steam plants under construction last September. It is a $69,000,000 station in San Fernando Valley. First of its eventual 512,000 kw will go on the line in '53.

Also out west, the U. S. Bureau of Reclamation entered its 50th year with a record in power expansion just behind it. The builder of multi-purpose projects outdid itself power-wise in '51, adding 771,000 kw of nameplate capacity, and jacking its totaled installed capacity to 3,939,500 kw in 23 power plants.

Coming back east, American Gas & Electric Service Corp. has a 1953 construction budget of $120 million for the 3,000,000-kw systems of its parent, AG&E. Construction in 1951 took $98,000,000.

Detroit Edison plans to spend $76,000,000 in 1952—18% more than it did in '51. Public Service Co. of Oklahoma would increase its 1951 expenditure of only $10,000,000 by 69% this year. Union Electric Co. of Missouri would top $45,000,000 in its construction to meet a 10% load increase. Philadelphia Electric Co.'s 1951 expenditure of $37,000,000 will jump to about $69,000,000 this year. Florida Power Corp. plans a $29,000,000 construction program, one-third above its expansion last year. Niagara Mohawk Power Corp., spender of over 57,000,000 construction dollars in 1951, has $64,500,000 to invest this year.

• Hydro for the hydrogen bomb—Back in the Southeast a hydroelectric plant of singular significance is being pushed to completion on the Savannah River by the Corps of Engineers. It is $80,000,000 Clark Hill Dam, upstream from Augusta—source of 280,000 kw that will power AEC's Savannah River H-bomb plant when it gets going. The first of seven generators will start spinning next October.

And so it goes.

The power industry, wiser for having been recently through an all-out war, is straining against the bit of controlled materials to do what expanding it feels necessary to maintenance of our short-of-war production effort. U. S. producers who in 1951 generated 43% of the world's total kilowatt-hours have construction plans well mapped for the years ahead. Whether their schedules are met is largely in the hands of the control agencies.

In any event, there's a whale of a lot of construction to be done in the next three years in raising our capacity to produce power.

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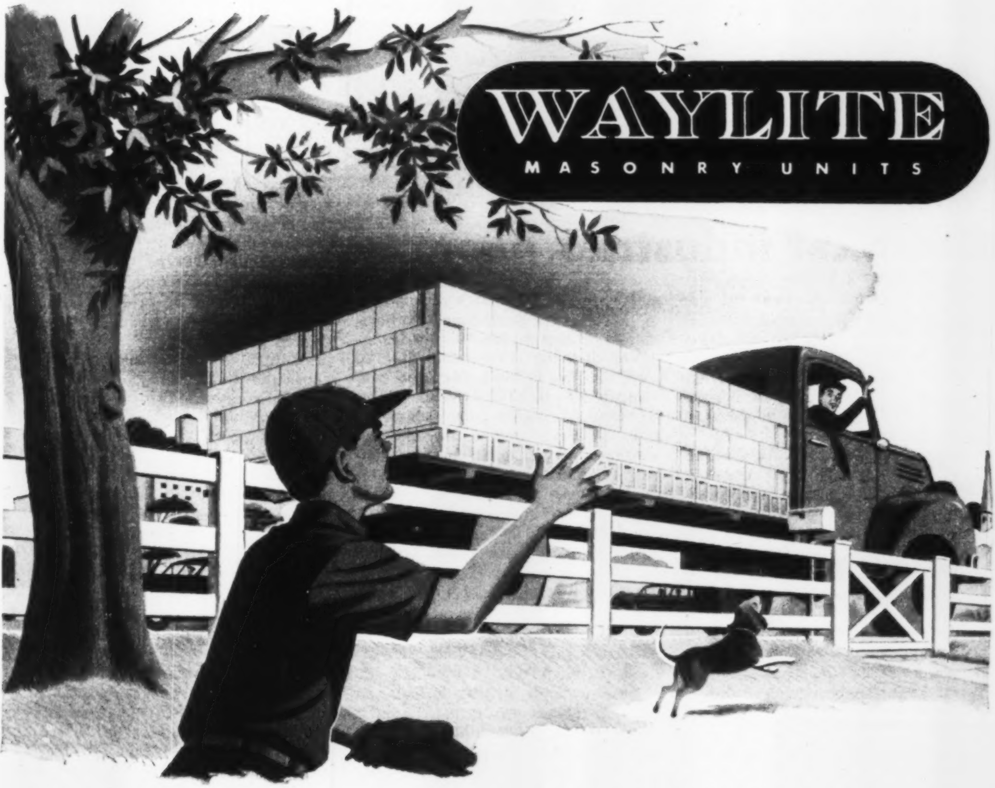
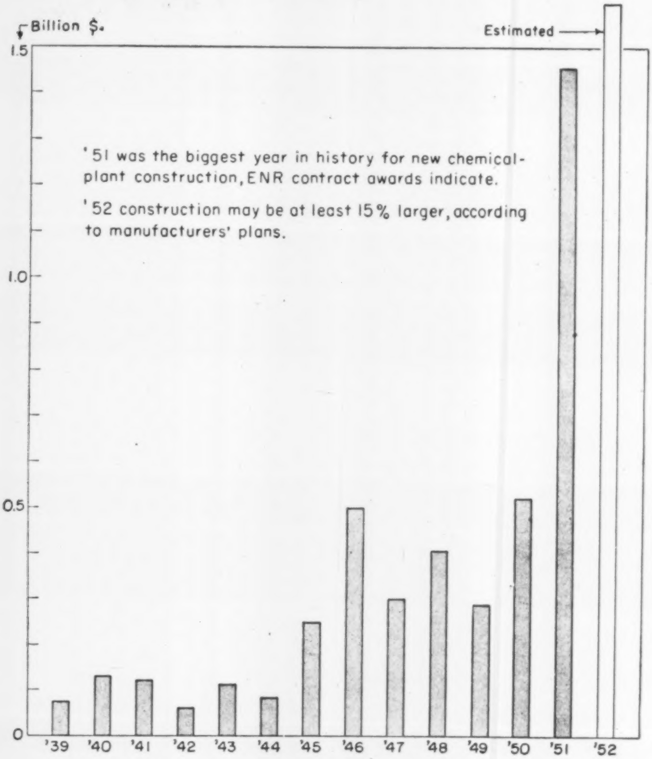




Raising our capacity to produce . . .

Chemical industries boom

FASTEST GROWING SEGMENT of the U. S. economy, the chemical-process industries are also the construction industry's biggest private customer.

Between 1925 and 1950, all industry grew at an average rate of 3% per year. In the same period, the chemical industries averaged 10%.

Last year, chemical-process industries started the largest expansion in their history. Dollar value of contracts awarded for new construction was more than 250% greater than for 1950. And further sharp expansion is in the offing—unless the government's Controlled Materials Plan throttles it.

Capital for expansion appears to be plentiful. Most of the financing is being done through the use of depreciation funds and retained earnings. When large-size borrowing is necessary, the industry seems to have no difficulty in obtaining money from insurance companies and other investing institutions.

Government assistance has been a major stimulus, although recent cuts in allotments of steel, copper and aluminum to the chemical industries indicate that the government may be more selective in the future in picking companies to be helped. Aid has taken the form of accelerated tax amortization, purchase and resale of vital materials, direct loans, loan guarantees, commitments to purchase at specified floor prices and part financing of exploration for materials.

• New products, new plant—Most of the new construction is for the production of recently developed products or of older, basic products by radically new processes.

Petrochemicals—materials derived from petroleum and natural gas—are a good example of the former. In 1940, there was an estimated capital investment of $350 million in the industry. By 1945, the investment grew to $1,200 million. Today, the total investment is over $2,000 million. As a result, about 25% of all the chemicals being made in this country at present are petrochemicals, and experts predict that by 1962 the percentage will be close to 50%.

End products include automobile antifreeze, synthetic fibers, cellophane and papers, explosives, adhesives, detergents and plastics.

The precipitous rise in chemical production, which made last year's record-breaking construction program necessary, is caused by a snowballing demand. If a new product is developed, it generally is not enough that new plants be built to produce it; new facilities must be provided for expanding production of its components. And frequently, it may also be necessary to build new plants for producing more of the chemicals needed for making those components.

For example, look at the effect of the expansion of synthetic-resin production—up 10% in '51 over '50 and with another 10% scheduled for this year. Formaldehyde requirements were immediately jumped. But formaldehyde-making needs methanol (synthetic wood alcohol), which is used in large quantities for automobile antifreeze; and antifreeze users have nothing else to turn to that is not in equally short supply. Furthermore, one of the other popular antifreezes—ethylene glycol—is derived from formaldehyde. So more facilities must be constructed to produce methanol as well as formaldehyde.

But there is another complication. Supplies of methanol available for making formaldehyde depend also on the demand for synthetic ammonia, since a large number of synthetic methanol units can be switched very readily to ammonia production. Which chemicals should be made? Defense production urgently needs both synthetic resins—for making plastics to be substituted for the metals needed for guns and shells—and ammonia—for production of explosives and fertilizers.

To date, the government has not had to build any additional synthetic ammonia plants. But new facilities, with total capacity over 100 million lb per year, are now under construction by private industry, increasing nitrogen production 25%. Still more are scheduled for early starts.

Raw material supplies for resins also may have to be increased. Not enough benzene and chlorine are being produced for phenol, plant capacity is inadequate for conversion of ammonia and carbon dioxide to urea, and too few facilities are available for producing pentaerythritol from formaldehyde and acetaldehyde.

• Synthetics expand—To turn to another field, synthetic fibers have now become an important part of our domestic and business life. They are providing new and improved clothing, drapes, seat covers, screens, carpets and tires.

From a pre-war 10%, synthetic-fiber production has grown to the point where it now represents 20% of all textiles. Biggest growth is in rayon, a semi-synthetic made from cotton linters and wood pulp. More than doubling in the last decade, rayon (viscose and acetate) production totals 87% of all synthetic fibers.

Last year, synthetic-fiber plants produced about 1.36 billion pounds, of which 180 million were the newer synthetics (up 24% from 1950). This year and next, experts predict, will see rayon capacity up 25%, as well as substantial increases in production of the new synthetics. The latter include nylon, polyacrylonitrile, acrylic copolymers, polyesters, vinyls, zeins and glass fibers.

DuPont, up to now sole producer of nylon, had a capacity for this fiber of 100 million lb in 1950. Last year, its capacity was 170 million lb, and this year it will probably reach 190 million lb. A license to make nylon was issued last year to Chemstrand Corp., which is now building a new plant at Pensacola, Fla., for the purpose.

Orlon, also made by duPont, is the first polyacrylonitrile fiber to be in commercial-scale operation. Two plants have recently been completed, with a total estimated annual capacity of 37,000,000 lb. The raw material, acrylonitrile, is supplied by American Cyanamid, which also supplies this chemical to producers of nitrile rubber. Plants are now being built to make acrylonitrile by a new process. Experts predict that orlon production will rise to 200,000,000 lb within a decade.

Several large companies are venturing into manufacture of acrylic copolymers, which could compete with wool in price. Union Carbide and Carbon Corp. expects to turn out 8,000,000 lb of Dynel this year and 30,000,000 lb by the end of 1953. Chemstrand Corp., newly formed by Monsanto and American Viscose for the purpose, is building a 30,000,000-lb-per-year plant at Decatur, Ala., for Acrilan. American Cyanamid has a pilot plant in operation at Stamford, Conn., and may decide to build a large-scale plant soon. By the end of 1953, experts say, production of the acrylic fibers by all companies will reach 100,000,000 lb.

Under license, duPont is now producing in limited quantities the polyester, Dacron, which is well suited for knit fabrics, such as sweaters and socks. A plant is under construction at Kinston, N. C., to turn out 35,000,000 lb per year.

COMPLEX EQUIPMENT turns out new chemicals—called petrochemicals—from natural gas, which are playing an important role in the chemical-industry expansion.

Vinyls are doing a heavy-duty job in industrial fabrics, upholstery and screening. Saran, produced by Dow, is being made at a rate of 20,000,000 lb per year, and the capacity of the saran plant at Freeport, Texas, is being expanded.

Zein fibers, like Virginia-Carolina's Vicara made from corn protein, dye better than wool and can be used in blends with wool and other synthetic fibers. A plant at Taftville, Conn., is now turning out 25,000,000 lb annually.

Production of glass fibers also is being upped. Owens-Corning has been making them since 1938. Now, Libby-Owens-Ford Glass Co. is beginning to produce them, and so is Guston-Bacon Mfg. Co. Other recent producers include Glass Fibers, Inc., Perrault Brothers, American Air Filter and Tilo Roofing.

• Rubber production up—To meet bigger civilian and military needs in 1952, rubber capacity is also being expanded. Current output of synthetic rubber plants is about 930,000 long tons per year, up 60% from '50. By the end of the year, they will top the World War II peak, and at that time they will be supplying 65% of the total rubber demand.

This expansion will be marked by further conversion of general-purpose (GR-S) plants to the so-called "cold" type. Output of cold rubber accounted for only 50% of last fall's GR-S production of 53,770 tons per month, but is being increased to 75% of the planned total GR-S output of 71,720 tons per month.

Other booming synthetics include: synthetic soaps, up from a small volume in the thirties to almost 1 billion pounds per year, and synthetic insecticides, now being turned out at a rate well over 25,000,000 lb per year. Perhaps, some of the pharmaceuticals might well be added, too—the antihistamines, the vitamins and the synthetic hormones. And mention might well be made also of the sulfa drugs and the antibiotics.

• New source for pulp—Last year's expansion increased wood-pulp capacity 8½%—about 1.4 million tons. If all the certificates of necessity already granted are acted upon, woodpulp ca-

NEW PRODUCT—NEW PLANT—NEW INDUSTRY. **Chemstrand Corp., formed to make synthetic fibers, is building a plant at Decatur, Ala., to turn out a new fiber, Acrilan, which can compete in price with wool.**

pacity will be increased by 2.5 million tons per year, or about 15% of present capacity. This will enable a considerable improvement in production of paper and paperboards, resin compositions, and rayon and acetate.

Of the expansion projects under way, eleven are for semi-chemical pulp—made by a combination of mechanical and chemical softening. They will boost output from 750,000 to 950,000 tons per year, tending toward a fourfold increase over a five-year period.

Production of dissolving pulp is showing a trend toward long-neglected hardwoods. Some of the newer plants will use a process that can make dissolving pulp from either hard or softwoods.

• Chlorine and sulfur—At the beginning of 1951, rated capacity of chlorine plants was 2.1 million tons per year, but it is slated to reach 3.4 million tons by the end of 1953. Though chlorine is needed for synthetic fibers, vinyl resins, insecticides, organic solvents, water treatment, disinfectants and bleaching of textiles and paper pulp, this rate of production, some experts believe, is more than industry will need. Evidently, allowance is being made for full-scale war.

With the increase in chlorine production, there will probably also result an excess of caustic soda—a byproduct of the electrolytic process of manufacturing chlorine. Some of the new plants, however, will produce chlorine without caustic by new processes.

Planned facilities for sulfur will add almost 1¼ million tons to the present 6¼ million tons annual capacity by the end of 1954. However, experts say that sulfur users are due for a tighter pinch in 1952. Sulfur is the workhorse in chemical processing.

Some relief may come from sulfur mining facilities going up at the new discovery near New Orleans. These should yield 500,000 tons per year by late 1953. There also will be increased supplies from petroleum-refinery waste-gas installations, natural gasoline plants and smelting operations. However, natural deposits still will supply more than half of the output expected by the end of 1953.

• Building-design trends—A study of ENR contract award figures makes it appear highly probable that more than half of the new chemical plants are being built south of the Mason-Dixon line. And in line with this industrial growth in the warmer climates, a trend has developed toward open construction.

More and more plants are being built with walls partly or entirely omitted. Representing an appreciable saving in construction costs, this is advantageous where climate permits, where an explosion or fire hazard exists due to the nature of the product being handled, or where relatively few operators are required and the equipment going into the structure is enclosed by protective housing.

Even in northern plants, though, there appears to be a trend away from masonry walls, because of the high cost. Studies made by Union Carbide and Carbon Corp. for its $100 million ferro-alloy plant at Marietta, Ohio, for example, indicated that large precast-concrete sandwich panels would be less expensive than brick Letting contracts for about a half-million square feet of precast wall, the company estimates savings of 30 to 50% in costs, and probably even greater savings in erection time (ENR Jan. 24, p 34).

Most of the newer plants are notable for the flexibility built in, to permit easy expansion, change in production processes and substitution of newly developed equipment. There is also a definite shift to greater instrumentation and more automatic equipment, as well as greater centralization of controls.

Accompanying the increase in chemical-production facilities, there has also been an expansion in research plant. Like the production buildings, the new laboratories are designed for flexibility. This means that the necessary services, as well as light, heat and air conditioning, must be available almost everywhere in the working areas. So laboratories lend themselves very well to modular design.

The emphasis on research gives a good indication of things to come.

• Future prospects—Undoubtedly, development of new chemicals and of new processes for the older chemicals will continue to pace the expansion of the industry: There already are indications of this:

• Organic-inorganic compounds—Most recent development of note in this field is the silicone plastics, which are being widely used for waterproofing, heat-resistant fluids, greases, resins and rubber-like materials. Another is the fluorocarbons, which make some of the most stable plastics known.

• Organic compounds from coal—New chemicals may be built up from the simplest hydrocarbon molecules obtained from coal or by combining hydrogen with coal under high pressure. Or older materials, like gasoline, may be synthesized.

• Protein chemistry—Larger and more complex molecules than presently encountered in polymerization may be developed—perhaps making possible duplication of the photosynthesis process of plants and the catalytic action of enzymes of animals.

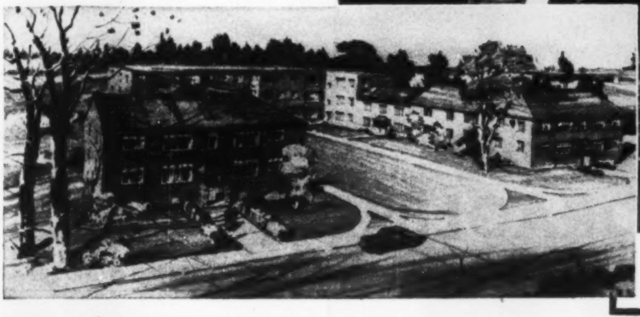
• Nuclear chemistry—And of course, there is an infinite range of possibilities in the development of nuclear fission and radioactive materials as a source of energy and new chemicals.

Whether the growth of the chemical industry comes from these or from new uses for the chemicals we now have, the industry will obviously remain one of construction's biggest customers for a long time to come.

A Solid, DRY foundation for the Swifton Village—

Cincinnati, Ohio

Al Loreti applying two coats of Thoroseal to foundation of one of 1200 units. Economy plus durability has made The Thoro System materials a "must" on the list of contractors who know the importance of masonry protection.



An architect's conception of a unit at Swifton Village where the $25,000,000 project will house 4,500 people.

THOROSEALING a foundation has been recommended by outstanding engineers for 39 years

The Jonathan Woodner Company, designers and builders of The Swifton Village, are using Thoroseal for foundation coatings on their 7-acre housing project.

The Thoro System materials, used on this project, furnished by the Oakley Coal & Supply Company, through The Nurre Company,. Cincinnati, Ohio.

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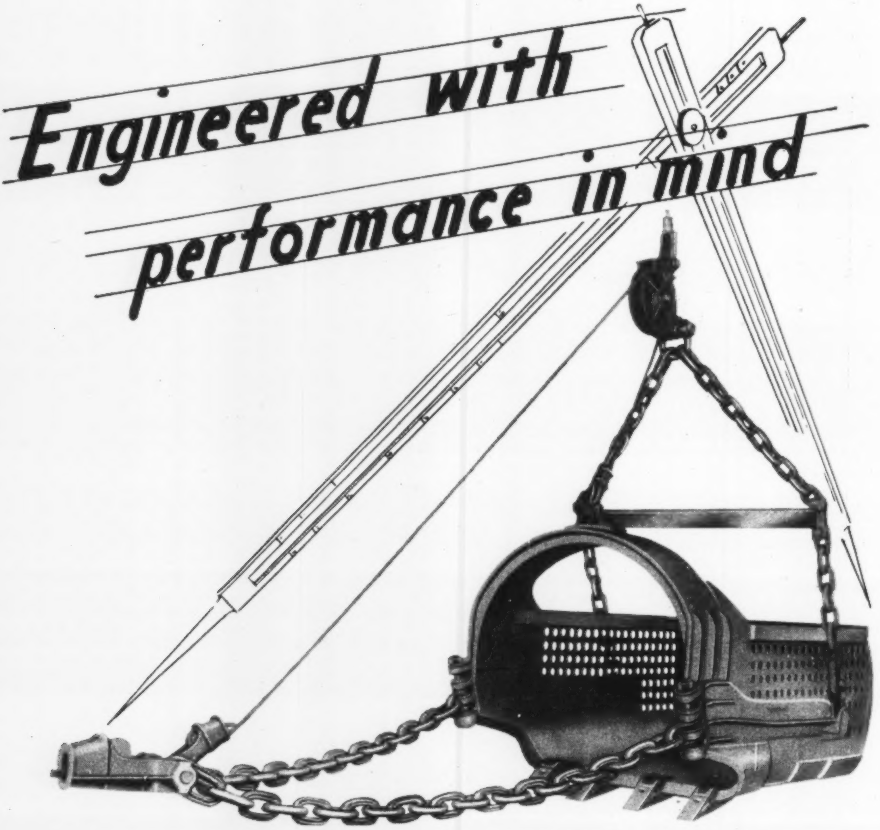

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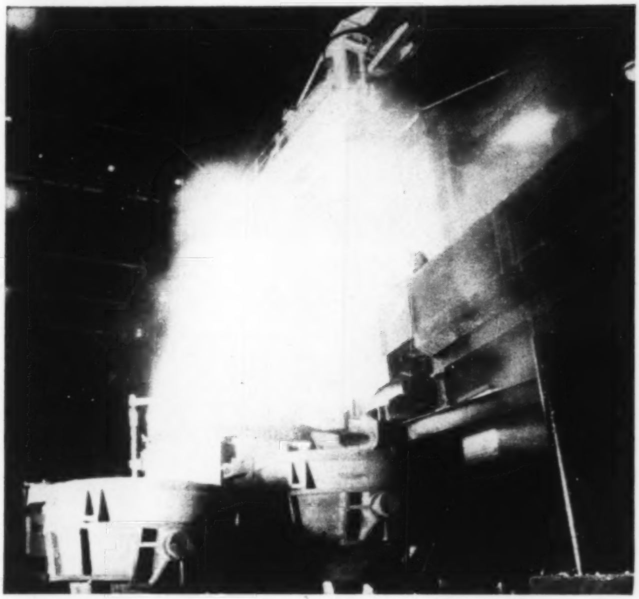


STEEL tapped from furnaces in Jones & Laughlin Steel Corp.'s new open hearth shop, will provide one of the biggest single sources of increased supply this year.

Raising our capacity to produce . . .

Metals loosen the logjam

CONTRACTORS AND ENGINEERS who are building new plant to make steel, aluminum and copper are setting the blasting charge which will break up the logjam in construction.

The first metals from the new plants have already started to flow into defense structures, and when the defense build-up begins to slow down, they will be available to meet the growing backlog of civilian needs. So the construction men building the new metals-producing plants are touching off a chain reaction expected to develop its full impact by 1953.

Output of the three principal metals that control construction—steel, aluminum, and copper—will increase during 1952. For steel and aluminum, this increase will be substantial. For copper it won't amount to very much, but it will be helpful.

Unfortunately construction will not reap much benefit from these increases during 1952. In fact, cutbacks in controlled materials for construction may cut the volume of construction by 10% or even more below the total for 1951. But prospects are that shortages will begin to ease slightly by the end of the year, and may disappear during 1953. Then or soon after—depending upon the future of defense requirements—America's increased capacity to produce these metals will be a mighty factor in raising the construction industry's capability to meet almost any demand placed on it.

• Here are the expansions—The American Iron and Steel Institute expects 6.5 million tons of ingot capacity to come in the first six months of the year—on top of the current 107 million tons capacity. An additional 4 million tons will be under construction during the year, and are due for production in the second half. Total production in 1952 is expected to be between 110 and 112 million tons.

In 1953 the picture looks even brighter. Capacity by the end of the year is expected to reach 120 million ingot tons, and production is seen approaching 118 million ingot tons. Construction men are working round the clock as the steel expansion program starts down the home stretch.

Aluminum producers expect to bring in 400,000,000 lb of new capacity in the first half of this year, on top of today's 1.6 billion pounds of capacity. Another 400,000,000 lb is expected to come in the second half. Total production for the year is expected to be over 2.1 billion pounds.

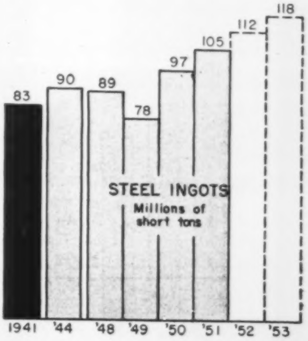
Target for the industry is to double the pre-Korea capacity of 1.5 billion pounds by 1953—and at the present record-breaking rate of construction, it looks like they'll reach it. Even before completion of the current $500 million expansion that will add 1.3 billion pounds of new capacity by mid-1953, a second round to add another 500,000,000 lb is in the making.

Copper, now being produced at an annual rate of 965,000 tons, is expected to be slightly more available during the last half of this year, and by the end of 1953 to reach a capacity 125,000 tons higher than at present.

• Copper is slow—But it takes years to open new copper mines and get them into full production. First real relief to result from the bulk of expansion now underway, will not arrive until 1954 when copper production should be approximately 205,000 tons per year above present levels. Projects already under way or contemplated in the U. S. or abroad should further augment supplies by 1956 so that the monthly supplies available could reach 150,000 tons (compared with 125,000 tons per month today).

• Steel forecast—Last year steel production in the U. S. nearly equalled the total of all other countries in the world. American output was more than three times the Soviet Union's 34 million tons. Production increased 8.4 million tons in the U. S., compared with 4.5 million in Russia, according to THE IRON AGE. Defense Mobilization Boss Charles E. Wilson says "the peak of the steel shortage has been passed."

The expansion of steel will make more steel available for construction



as the year advances, in spite of increased military requirements. In fact, there may be surpluses of some type of steel, notably sheets, by the end of 1952.

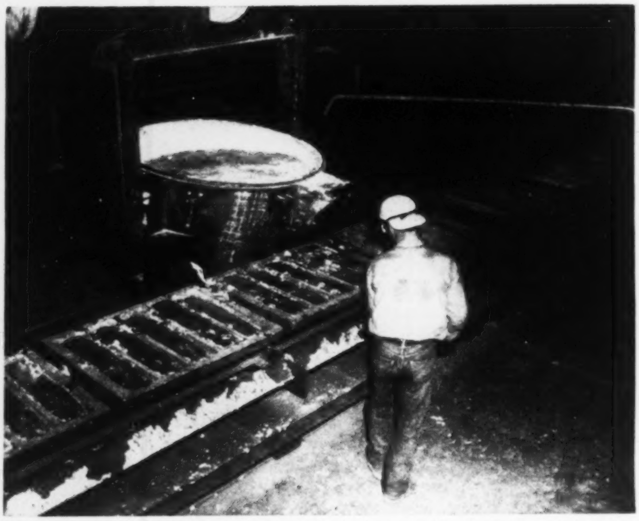
This will help construction appreciably. But structural steel will continue to prove a limiting factor.

There is no additional structural steel capacity under construction, so that increased availability of structurals will depend largely upon how much is used in shipbuilding, railroad car production, and other programs which currently take about 50% of the total output. And there is not much hope for a letup in those programs.

There is another possible source of relief, however. Plenty of increased plate capacity is being built up. Should military demands for plate slacken, fabricators could make more structurals from plate. Lately there has been a definite trend in this direction. It could ease the structural shortage earlier than now anticipated.

Use of substitutes—such as prestressed concrete—and other materials in buildings where structural steel is not essential, may also free more structurals for use where no substitutes can be used economically.

During the fourth quarter, the structural picture should begin to improve for the construction industry, because a large part of the essential defense construction requiring structurals will be past the erection stage. But the big relief from the steel shortages appears destined for 1953.



MOLTEN ALUMINUM is poured into a pig form at Aluminum Co. of America's Point Comfort, Texas, plant. Expansion here will bring in 70,000,000 lb of capacity.

- **Aluminum forecast**—Aluminum production will be rising this year even faster, percentage-wise, than steel, and it is possible that even more expansion will be scheduled.

But aircraft production will soak up most of the increase in aluminum production over the next year. Allocations for construction, after dropping in the second quarter this year, may get no worse in the third quarter, and should improve thereafter.

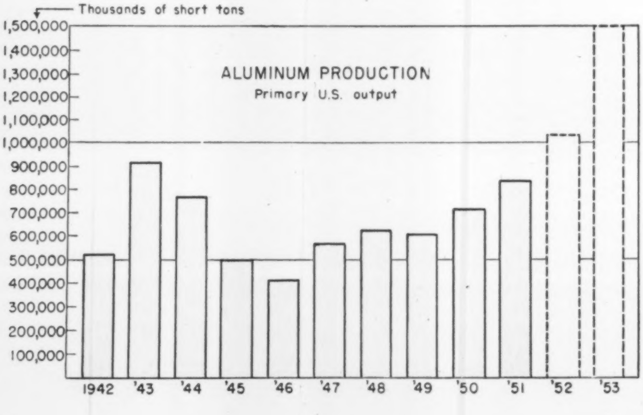
Potentially, the aluminum expansion, like that for steel, will aid construction. The building industry has been the number one customer for aluminum products for the last decade, and even now is still nosing out transportation—including aircraft—by a few percentage points.

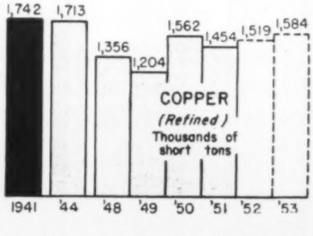
In the new plants, aluminum producers will be able to make more extrusions and to roll more sheets. And it is these two products that will have the greatest effect on construction—as walls, roofing, partitions, and in thousands of other applications. Aluminum wiring is being used widely to substitute for copper. Look for a boom in aluminum building materials to start in 1953.

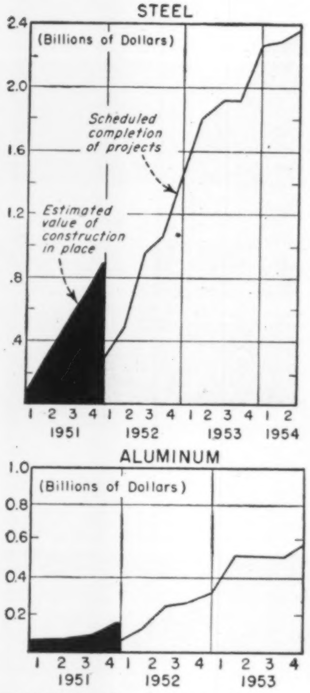
- **Copper forecast**—Copper is apt to put one of the main crimps in building in 1952, and even during 1953. Mobilization Chief Wilson says he can see "no help in the copper shortage situation until at least 1954." What alleviation of the shortage does develop must come from the substitution of aluminum in some items and from imports in increasing quantity.

Military requirements for copper are due to go up fast. Inventories of brass and copper products are probably sufficient to carry builders through the first quarter. But the increase in military use of copper will have to come largely out of consumption in non-defense industries.

Second quarter allocations of copper for non-defense work are lower than in the first quarter, and the situation will get worse in the third







PROGRESS of expansion projects.

BLAST FURNACES such as this one under construction at U. S. Steel's Fairless Works, will supply iron for steelmaking facilities that will add 1.8 million tons capacity to the industry by the end of the year.

quarter. In the fourth quarter it may get slightly better.

The government is paying premiums to keep higher cost mines open because federal price controls threaten a slowdown in output. This move is expected to flush out something like 1,000,000 lb over the next year. That's about 10% of the 1950 domestic production, and would mean about a 7% increase in the current rate of supplies domestic and foreign.

Copper imports are expected to stay lower than they were in 1950 unless pricing policy changes. The U. S. refuses to spend more than 27.5 cents per lb for foreign copper, which is bringing 42 to 54 cents in the world market. Imports have recently been running at about 30,000 tons a month, compared to 40,000 tons a month in late 1950. There is no indication pricing policy will change, but if it should, the copper situation could be relieved earlier than 1954.

But the big copper expansion underway will pay off eventually. First big relief is in sight for 1954. By 1955, production may be 1.15 million tons compared to 950,000 last year.

• Construction forecast—Together, the expansion programs in the three industries now exceed $4 billion. Most of this is going directly into construction of one type or another.

The steel industry spent about $1.2 billion for expansion and improvements in 1951, compared with $513 million in 1950. This year it will probably spend an additional $1.3 billion. Aluminum expansion, tagged at $500 million, will complete the major part of its program this year. Development of seven domestic copper ore bodies under present plans will cost an estimated $280 million. More millions will be spent developing ore bodies outside the country, particularly in Chile.

Here is some pin-pointing of schedules based on expectations that construction of new facilities for these metals will not be delayed:

(1) STEEL—Jones & Laughlin Steel Corp. at Pittsburg, and U. S. Steel Co. at Morrisville, Pa. will contribute the biggest single chunks of new capacity. J&L has just under 2 million tons of expansion underway, including 11 new open hearth furnaces. Most of this will be in production by midyear. U. S. Steel's Fairless Works is expected to make its first steel by August, and be fairly close to 1.8 million tons a year by the end of 1952.

(2) ALUMINUM—Aluminum Co. of America will bring in a 70,000,000-lb plant at Point Comfort, Texas, in May; the first unit of its 170,000,000-lb plant at Wenatchee, Wash. in June; and the first unit of its 170,000,000-lb plant at Rockdale, Texas, by September. Reynolds Metals Co. expects half of its 150,000,000-lb plant at Corpus Christi will start production soon. The second half is due in April, but Reynolds is having trouble getting equipment. Reynolds also has a 40,000,000-lb plant to come in this year at Troutdale, Ore., and a 110,000,000-lb project to be located in Arkansas to start output by year's end. Kaiser figures its Chalmette, La., plant to step up output until it reaches 200,000,000-lb annual capacity by July. And its 40,000,000-lb plant at Mead, Wash. comes in this year.

(3) COPPER—Lone advance in domestic copper output this year will come from Anaconda Copper Mining Co.'s Greater Butte project. To turn out about 45,000 tons a year four years from now, it is expected to start producing around mid-1952 at an initial annual rate of 20,000 tons.

PICTURE OF A MACHINE

replacing 40 hand laborers

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PARKLABREA—Metropolitan Life's apartment project in Los Angeles took three years to build, now houses 4,253 families.

Techniques and trends . . .

Buildings and Housing

THE PROSPERITY that blessed the building industry in 1950 continued throughout 1951. In a few parts of the country, however, some signs appeared that there was not going to be enough butter for a guns-and-butter economy.

Plans disclosed by industry and the availability of investment capital indicate that '52 could be an even better building year than '51. But Defense Production Administration plans for allotment of steel, copper and aluminum make it appear that almost all building not essential to defense will be curtailed after March.

How serious the effect of inadequate DPA allotments may be depends on the ingenuity of building designers. If they can find ways to use substitute materials, the volume of private construction can still remain high in '52.

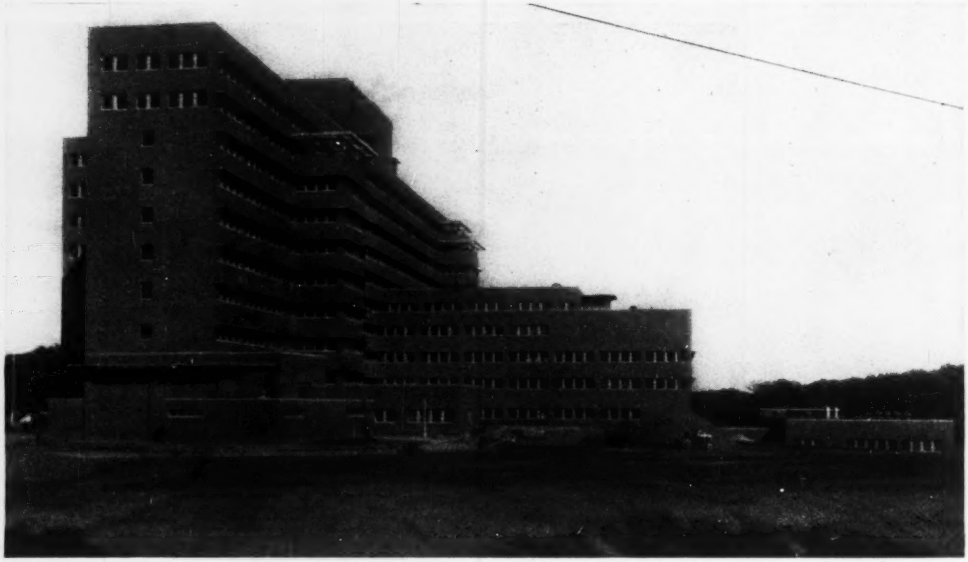
• **Industrial building sets record**—In 1951, the volume of industrial building hit an all time high. It was twice as large as the '50 volume—the previous record.

Almost 90% of the total was privately built—2½ times private industrial building in '50. Leaders in this unprecedented expansion were the chemical, metal and machine-tool industries and public utilities (see pages 68, 72 and 77). More than half of this new construction was erected in the Middle-West and West-of-the-Mississippi sections of the country, representing a drift toward the interior.

Public industrial buildings, greatly influenced by the size of contracts awarded by the Atomic Energy Commission, was off 45% from 1950. In addition to AEC plants, the bulk of this construction was for ordnance.

Encouraging the industrial boom, building costs remained nearly constant last year, according to the ENR index. While wages went up slightly, lumber prices dropped, so that the net change was an increase of only about 3% in the index.

• **Good year for housing**—Residential construction last year also turned in an unexpectedly high score. Hampered by government credit restrictions, home builders issued gloomy predictions throughout the first half of the year; they thought they would not be able to build even the maximum of 800,000 units the government desired. Nevertheless, the number of



VA HOSPITAL providing 489 beds, at Iowa City, Iowa, was one of twelve completed last year by the Corps of Engineers.

units started during the year was the second highest on record.

Total starts came to 1,090,000, just topping the 1,025,000 started in 1949. In the meantime, the record stands at 1,397,000, established in 1950.

At present, home builders appear to be in a better position than the rest of the building industry with respect to government controls. Despite down-payment requirements, there appears to be no shortage of purchasers, and in most cases, builders can obtain steel, copper and aluminum without applying to Washington. However, DPA has announced that it will allot for housing in the second quarter only enough materials for an annual production rate of 600,000 units. As a result, the National Association of Home Builders has warned its members not to start a new project unless sufficient materials are on hand to finish it. The prospective materials shortage, thus, may cause starts to drop in '52.

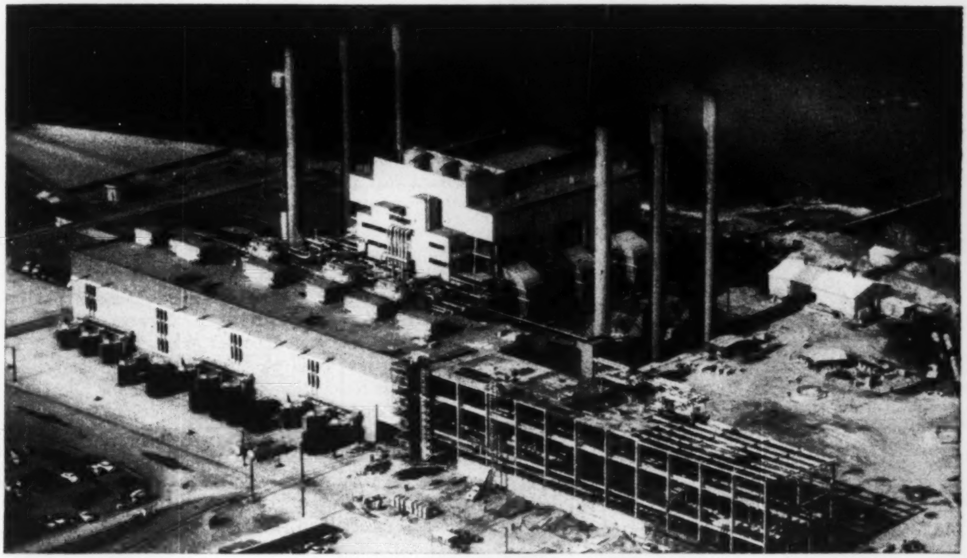
In the Defense Housing Act of 1951, passed in August, Congress authorized appropriations of $50 million for public defense housing; $60 million for acquisition of community facilities and services (streets, sewers, schools); $15 mllion for loans to existing housing sites; and $1.5 billion additional federal mortgage insurance. The law requires federal officials to give private enterprise a chance to build any housing the President declares necessary for the defense effort. In view of looming materials shortages, there appears to be little chance that private builders will forfeit the opportunity.

Last year was also a good one for house prefabricators. They turned out about 50,000 units, only slightly less than in 1950. While only half the amount the Prefabricated Home Manufacturers' Institute predicted at the beginning of the year, their production still was 50% greater than in years previous to 1950.

• Commercial building faces dull future—Like housing, commercial-building volume last year turned out to be surprisingly high. Though off 38% from the record, set in 1950, it nevertheless topped 1949 by 4% in dollars spent. This performance is amazing in view of credit restrictions and the small quantities of essential materials allotted for commercial building.

Since, however, DPA is now allowing only essential construction to proceed, commercial-building volume is expected to drop in '52 to less than half of last year's mark, bolstered mainly by commercial building related to defense projects. This will seriously hurt the building industry in a few of the nation's largest cities, where defense construction has not yet taken up the slack. Already, in New York, Baltimore, Dallas and San Francisco, builders have held protest meetings, claiming the defense program is bypassing them and causing serious unemployment. Despite this, DPA officials announced even smaller allotments for the second quarter of '52 and implied gloomy prospects for the remainder of the year.

• Prospects for hospitals and schools—To date, the DPA appears to be doing all it can to facilitate construction of hospitals and schools. So far, no hospital application has been denied, and no project has been



CONTRA COSTA STEAM PLANT at Antioch is being expanded by PG&E to help meet California's power needs.

deferred more than one quarter. Schools have been allotted sufficient materials to permit construction at an annual rate equal to the highest on record.

Encouraged by allotments and subsidized with federal grants, construction of hospitals approved by the U. S. Public Health Service for Hill-Burton Act aid totaled 400 projects, completed, providing 16,000 beds. USPHS expects 200 projects, with 8,500 beds, now under construction, to be finished this year, and 200 projects, with 8,000 beds, to be started. Congress appropriated $100 million for hospital grants last year and $182.3 million for fiscal '52.

The Veterans Administration last year opened twelve new hospitals. This year, it expects to complete 19 more of 500 to 1,000-bed capacity. Probably, five or six new projects will be started.

Some or all of these will incorporate a bomb-resistant core. Enclosing elevators and a continuous stairway, these cores probably will have reinforced concrete walls and roofs 12 in. thick. Connecting corridors to outlying buildings may be placed underground, with at least 3 ft of cover. In addition, all the new buildings may have reinforced concrete structural frames, to conserve steel.

Construction of elementary and secondary schools last year was at an all-time high, according to DPA estimates. How far this went toward relieving the shortage of educational facilities is not known. Results are not yet available from the survey being conducted by the School Housing Section of the U. S. Office of Education to determine school needs throughout the country, and the adequacy of state and local resources to meet these needs. But the Office of Education estimates that 600,000 more classrooms are needed in the next seven years for public elementary and secondary schools.

According to the DPA, second-quarter allotments will permit 500 more schools to be started, bringing the total under construction to 2,400. Allotments for colleges and libraries in that quarter will support the 241 units now under construction and enable starts to be made on 19 new units, mostly medical schools and research laboratories.

• **Atomic-energy plant expansion**—One agency that is fairly certain of being allotted all the materials it needs is the Atomic Energy Commission. The AEC now has a capital investment in plant and equipment of $2.5 billion, and is in the throes of an expansion program that will build up that investment to $5 billion. On top of that is a weapons-plant program costing more than $5 billion that may be started this year.

The experimental breeder reactor at Arco, Idaho, has been placed in operation. Its purpose is to determine whether it is possible to create new nuclear fuel faster than it is consumed, while producing power. First tests showed the reactor capable of producing power, but the AEC has not yet revealed whether the breeding process works. Unless it does, the amount of nuclear fuel available is limited only to that which can be obtained from the ground; if it works, the supply of fuel may be limitless. Design of full-size atomic power plants is awaiting the results of current tests.

The AEC has been making radioisotopes available

ALUMINUM SKIN is fast enclosing the 30-story skyscraper Alcoa is building in Pittsburgh.

to industry, hospitals, colleges and research laboratories for various purposes. These "hot" materials are dangerous, so that precautions must be taken to protect personnel who have to handle them. Last year, the AEC released much information on this subject. The safety measures recommended call for new concepts in design and construction, such as extensive remote-control handling of chemicals, shielding against highly penetrating radiation, decontamination of accidentally radiated building materials and disposal of radioactive wastes (ENR Dec. 20, 1951, p 30).

• **Trends in building**—One of the most exciting developments during the year was the first application in this country of fully prestressed concrete to beams and girders in buildings. First use of this technique in this country had already been made in bridges and a grandstand the previous year (see p 106).

Buildings containing prestressed members have now been completed in Tennessee, Virginia, Ohio and Oklahoma. Probably influenced by the steel shortage, engineers in these and many other states report plans for incorporating prestressed beams in their new jobs, and some starts have already been made. Spans being used so far range up to 70 ft. Tests are being made to see if prestressing also can be used economically in the Youtz-Slick method of construction, in which large floor or roof slabs are cast on the ground and jacked into place.

Another important development last year was a revision by the American Concrete Institute of its building-code requirements. The revision included a provision for higher bond stresses for reinforcing bars meeting American Society for Testing Materials Specification A305, which sets a standard for size and spacing of deformations on bars.

Next step in improving the economy of reinforced concrete construction is to allow higher tensile stresses for the new bars. This is not unrealistic, since laboratory tests have shown that the new bars control the size of cracks far better than the older bars did.

Last year also, a new building-foundation technique was given a tryout. A Veterans Administration hospital is being built in New Orleans almost across the street from the Charity Hospital, which has settled 18 in. since it was built in 1939. To prevent settlement of the new building, designers called for a combination floating and pile foundation. Excavation was made as deep as possible to reduce net load. Wood or cast-in-place concrete piles were driven into a sand layer, and a mat foundation was substituted for pile caps.

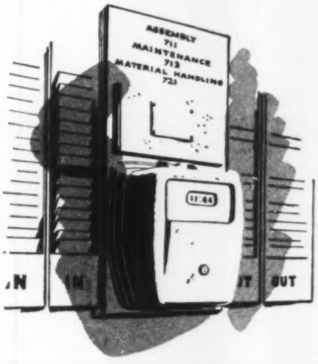
In Rochester, Minn., a large steel-frame building was completed for which all field connections were made with high-tensile strength bolts (90,000-psi minimum yield point). Bolts were tensioned to about 86,000 psi. Stresses on a connection are resisted by friction, rather than shear on the bolts.

The structure is the Mayo Clinic Diagnostic Building, which was built 11 stories high initally, but was designed for addition of 10 more stories in the future. Its structural frame could not be field riveted because of the noise. Cost studies indicated that use of high-tensile bolts was the most practical and economical of the remaining alternatives.

The trend toward welding of steel framing continued last year, while the trend toward precast-concrete curtain walls turned into a positive shift away from masonry. Placed in large sections—8 ft high and 8 to 25 ft long—the precast panels are proving lower-cost than brick, and the designers consider them attractive. For many structures, panels of "sandwich" construction, in

(*Continued on page 87*)

STATLER CENTER in downtown Los Angeles consists of a 14-story office building and a 1,275-room hotel.



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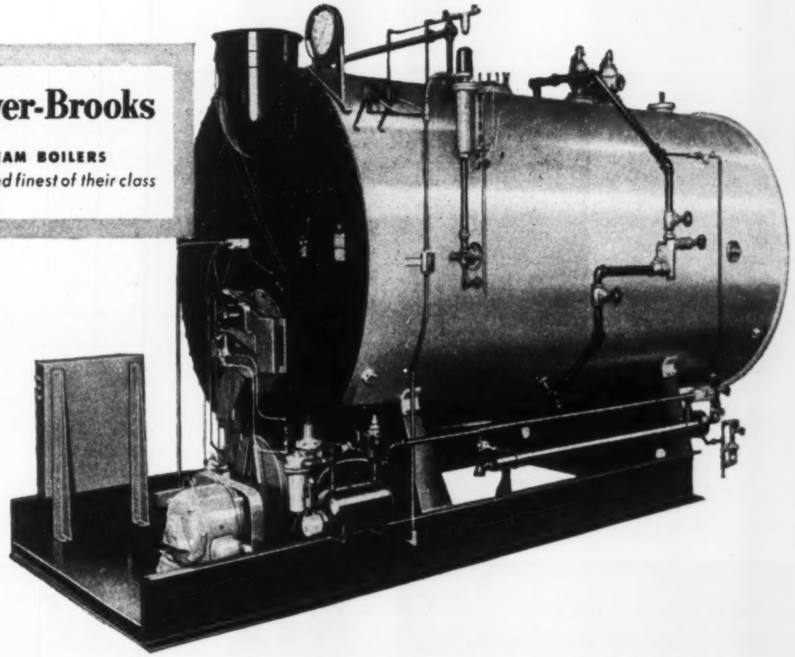

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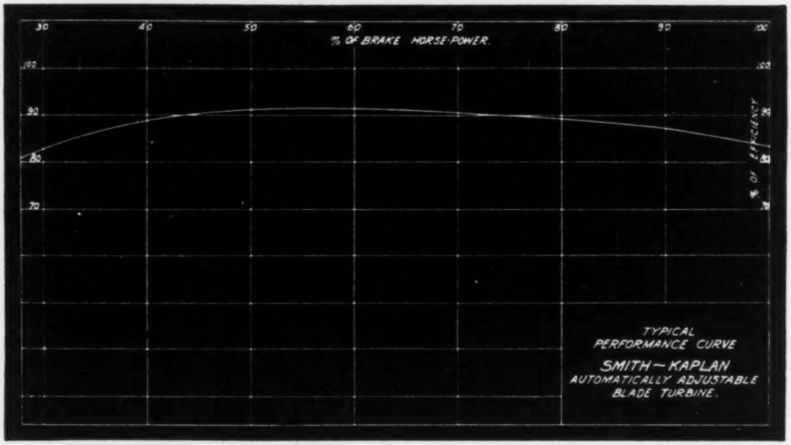

POWER *by* SMITH

(*Continued from page 84*)

which a layer of rigid insulation is placed between two thin concrete facings, were used, enabling the wall thickness to be cut to about 5 in.

While prefabricated housing showed no gain last year, a definite trend developed toward packaged industrial buildings. No figures are available for total output of the industry, but Herbert B. Luria, president of Luria Engineering Corp., reported in a year-end statement that more standardized buildings for industry went up in 1951 than ever before. Last year one established company tripled its '50 production.

A trend toward air conditioning of new office buildings has been noted for a long time. But last year, it became evident that many of the large older structures were also being equipped with air conditioning to meet the competition. Indicative of this trend is the fact that steps were taken to air condition the Empire State and Chrysler Buildings—the world's tallest buildings.

A new lighting technique was adopted by the U. S. Department of Agriculture's Plant Industry Station at Beltsville, Md. Slimline fluorescent lamps operating on 360 cycles were installed. Benefits are reported to be significant: More light is produced for the amount of current required, and tiny capacitors are substituted for conventional ballasts. Development of a new lighting circuit and a static frequency inverter without moving parts or electronic tubes makes this advanced system possible. Early application is indicated for lighting installations in large industrial plants and commercial buildings. Also, late last year, development of an aluminum alloy for the base of incandescent lamps was announced.

Some Major Building and Housing Projects

- **Alabama State Coliseum**—Built at a cost of $1.5 million at Montgomery, Ala., the structure is circular in plan, with an outside diameter of 340 ft. It is roofed with a thin-shell reinforced concrete barrel arch, with parallel ribs extending to footings 375 ft apart. The ribs are also supported by vertical posts 286 ft apart.

- **Allen County Coliseum**—This war memorial near Ft. Wayne, Ind., has a roof supported on steel rigid frames with a clear span of 225 ft. Built at a cost of $2,702,000, it is 350 ft wide by 415 ft long. It has a basement exhibition hall and a flat-slab arena floor surrounded by concrete bleachers. The building is now enclosed but will not be ready until June.

- **Aluminum Company of America**—Over $300 million is being spent in the present expansion program. Two new smelting units, increasing aluminum capacity by 35,000 tons annually, will be in production this spring at Point Comfort, Texas. A four-unit plant now under construction at Wenatchee, Wash., will have 85,000-ton capacity. The first unit is expected to be in operation this summer. Another 85,000-ton plant—at Rockdale, Texas—will probably start production in the fall. A new alumina plant capable of producing 400,000 tons annually is scheduled to start operations this summer at Bauxite, Ark. Alumina capacity of the works at East St. Louis, Ill., was nearly doubled last year, and at Mobile, Ala., an expansion to be completed late this year is adding 220,000 tons capacity. The company's 30-story aluminum-faced headquarters building in Pittsburgh, Pa., is expected to be ready for occupancy in late spring.

- **Atomic Energy Commission**—Biggest project under construction is Savannah River, now estimated to cost $1.2 billion. Plans call for 259 buildings—63 operating and processing buildings, 79 utility buildings and 117 service buildings. The project is about 10% complete. Second largest is the $500 million gaseous diffusion plant at Paducah, Ky. The $230 million expansion at Oak Ridge is nearly completed.

- **Bronx Hospital Center**—Construction started last summer on the first unit—a 500-bed, $14 million tuberculosis hospital. Built in the Bronx, New York City, it is a 7-story, Y-shaped building with a structural steel frame and glazed brick walls. Completion is expected late this year. Plans have been finished for the second—an 800-bed, $17.5 million general unit.

- **Celanese Corporation of America**—Major expansion program, costing $20 million for the Celriver plant at Rock Hill, S. C., will roughly double the productive capacity of the original $40 million plant, which was completed in early 1949. Started in late 1950, the work includes a staple fiber unit, with additions to all production departments and necessary services. At year's end, building work was substantially complete, and equipment and service installations about 50% finished. A $20 million Petro-chemical plant at Pampa, Texas, was started last spring and is scheduled for completion this April.

- **Chemstrand Corp.**—Plant near Decatur, Ala., to produce Acrilan, and acrylic synthetic fiber, will start production in April. Facilities consist of 14 buildings ranging in size up to 400x500 ft for the main manufacturing building. Annual capacity is rated at 30,000,000 lb of staple fiber. At Pensacola, Fla., construction is under way on a nylon filament plant, rated at 50,000,000 lb, to be completed in 1953.

- **Chrysler Building East**—Finish work is under way on this 32-story office-building annex to the 77-story Chrysler Building, in New York City, once the world's tallest building. Of steel-frame construction, the new structure is completely air conditioned. Fluorescent fixtures provide an average lighting intensity at 35 ft-c at working level.

- **Chrysler Corp.**—Tank plant, nearing completion at Newark, Del., is 600 ft wide and more than a mile long. It has a structural steel frame, sprayed-on concrete walls and light-gage steel roof.

- **Consolidated Vultee**—A 1,400,000-sq ft guided missile plant at Pomona, Calif., was started in 1951, with completion due in mid-1952. The structures have precast concrete walls and steel columns and trusses. Major units are to be air conditioned. Plant is being built with federal funds under contract with the Navy.

- **Courtaulds Inc.**—Construction began late last summer on a plant near Mobile, Ala., that will produce 50,000,000 lb of rayon staple fiber annually. There will be six buildings, largest of which is 1,100 x 180 ft. Completion is expected early next year.

- **Detroit Civic Center**—A $2,255,000 contract has been awarded for the structural steel framework of the 15-story city office building and 20-story county court building—second unit in the city's Civic Center development at the foot of Jefferson Ave. Delivery of the steel is tentatively expected during the third quarter of this year. The $1,700,000 substructure contract is 45% finished. Work completed to date includes excavation, and the construction of 126 bell-bottom concrete caissons from 58 to 84 in. in diameter and about 90 ft deep. Contracts for electrical, mechanical and other skilled-

(*Continued on page 90*)

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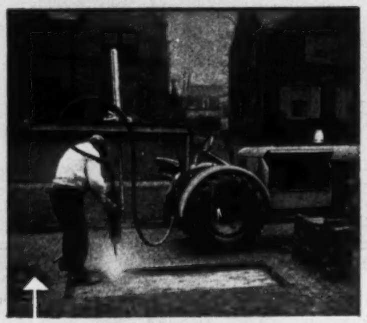
Hydraulically-operated Back Hoe — Tractor-compressor-back hoe combination offers big savings on digging jobs too small for power shovels, too big to be done economically by hand labor. Bucket sizes, 12" to 22". Digging depth, 6' to 7'. Swing, 60° each side of center.



Le Roi-CLEVELAND Patcher mounts on rear platform of Tractair. Drills closely-spaced holes within 7-foot radius, then broaches the section of pavement loose for easy removal. On this job, the bricks were removed first to get to the pavement underneath.

Pavement Breaking — Tractair puts air power to work running Le Roi-CLEVELAND Breakers. When the breaking job is done, Tractair mops up with its front-end loader. Tractair can be used also to run Le Roi-CLEVELAND sinker drills, clay spades, backfill tampers.

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on railroad siding job gives more than twice former footage for less than half equipment cost

As much as 750 feet of hole daily, where only 300 feet were drilled before! More than double the production of three hand-held sinkers and a 315 cfm compressor! Substantial savings on both fuel and equipment costs! That's the remarkable record of a Le Roi Tractair Mobildrill on the Coal River Mining Company's development of a railroad siding at their strip mine in Nellis, West Virginia.

Tractair Mobildrill is a light-weight Le Roi-CLEVELAND wagon drill unit mounted on Tractair — a combination 35-hp tractor and 105-cfm compressor. One man can drive the Tractair Mobildrill and handle every phase of drilling — vertical and horizontal holes at any angle and any elevation up to 12'. Swinging boom permits drilling 4-6 holes of a pattern from one spot.

The Mobildrill attachment is just one example of how Tractair's versatility pays off in lower costs and minimum investment in special equipment. The usefulness of Tractair can be multiplied by using Le Roi-CLEVELAND air tools for breaking pavement, clay digging, tamping fill. Tractair also can be used for loading, lifting, backfilling, snow-plowing, etc., when equipped with a front-end loader and special attachments.

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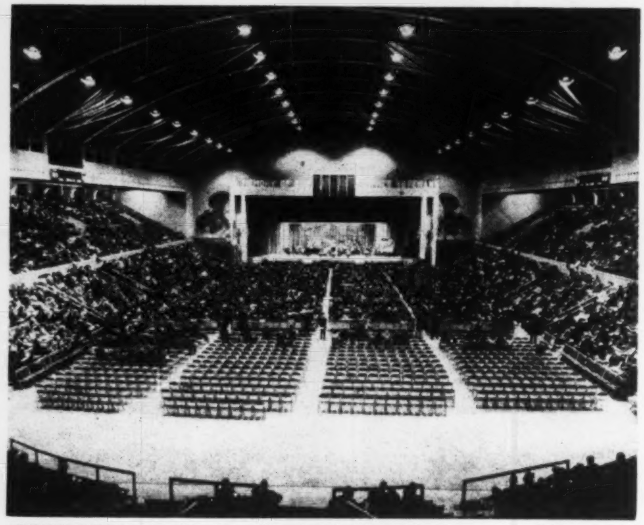
Loading — Front-end loader can be attached to Tractair in only a few minutes. Boom combines bucket and crane. Crane folds back out of way when not in use. Bucket holds 10½ cu. ft. — lifting capacity is 1000 lbs. Lifting capacity of crane is 800 lbs.

Backfilling — Replacing the bucket on the loader with a backfill blade adds to the variety of jobs a Tractair can handle. Backfill blade is 6' wide, mold board is 2'8" high. Maximum lift above ground is 1'4".

Trac-Jac — A Le Roi-CLEVELAND air-feed sinker drill mounted on a Tractair. Feeding and drilling controls are within easy reach of operator. The mobility of this unit makes it ideal for mud-jacking and many other applications.



AUDITORIUM in the Onondaga County War Memorial, Syracuse, N. Y., has an area of about 40,000 sq ft unobstructed by columns. It has a thin-shell concrete roof.

(*Continued from page 87*)

trades construction are expected to be awarded early this year.

• **Fairless Hills, Pa.**—Not far from the new Fairless Works of the U. S. Steel Co., 1,250 acres of farmland are being converted into a town to have an estimated population of about 10,000. Plans call for 4,000 prefabricated houses, of which 1,100 were under roof at year's end and 200 occupied. They are being erected at a rate of 16 per day.

• **Ford Motor Co.**—By this fall, Ford's $50 million expansion and improvement program for its River Rouge steel plant will be virtually completed. This will increase the plant's capacity for finished steel by 190,000 tons per year. Ford also is spending an additional $50 million to modernize and improve facilities at its Rouge Works. This includes a new foundry, conversion of an old aircraft building into an engine plant, and 80 new presses ranging from 400-ton single action types to 1,000-ton triple action models. New Ford plants either completed or under construction include: an assembly plant for Lincoln-Mercury at Wayne, Mich.; and a tank plant, a jet engine plant, and a bazooka-rockets manufacturing plant, in the Detroit area. The company's new foundry in Cleveland, Ohio, containing more than 1,000,000 sq ft of floor area will be finished this year. Also under construction is a $50 million research and engineering center at Dearborn, Mich.

• **1407 Broadway**—Built at a cost of $20 million, this 42-story green-brick building covers an entire block front in New York City. It offers 829,600 sq ft of floor for offices, showrooms and manufacturing for the textile and wearing-apparel industry. Vertical breaks in the green-brick facade enabled the architects to produce an interesting design and more corner offices. The structure is set back above the third floor to cover only 65% of the lot, with 35% of rental space in a tower, for which higher rents could be charged.

• **Jones & Laughlin Steel Corp.**—During 1951 and 1952, $200 million is being invested in modernization and expansion. Of this, $103 million is being spent at Pittsburgh works, $43 million at Aliquippa works, $34 million at Cleveland Otis Works, and $18 million in new raw materials facilities. The present program will increase production capacity to 6,406,000 ingot tons per year.

• **Kaiser Aluminum and Steel**—Kaiser Aluminum and Chemical Corp. started a $200 million expansion program in 1951, which, when completed, will boost output of primary aluminum 132%. At the $150 million aluminum reduction plant at Chalmette, La., near New Orleans, the first unit is in operation. It will be the largest primary aluminum plant in the country, with a capacity of 400 million lb a year. In addition, $23 million is being spent to expand the alumina plant at Baton Rouge, La., 60% over the planned original rated capacity.

Kaiser Steel Corp. last year spent $17 million to complete its eighth open hearth furnace and related facilities at Fontana, Calif., and to improve coking coal mines in Utah and iron ore mines in Riverside County, Calif. Another $24 million project is under way at Fontana to build a new tinplate mill, which will be completed in the first half of 1952 and will have 200,000 tons yearly capacity.

• **Kraft Foods Co.**—Structural frame, roof and walls of a 225,000-sq ft air-conditioned plant at Decatur, Ga., completed in December, were constructed of precast concrete. Thin, ribbed roof panels are supported on rigid frames made of hollow box sections, which were formed by bolting two concrete channels together. Of sandwich construction, walls consist of 22x21-ft panels, only 6 in. thick, with a cellular-glass insulation core. Contract price for the superstructure was $1,600,000.

• **Lakewood Park**—This 17,000-home development near Los Angeles had 6,500 homes completed and 4,500 under construction at the end of the year. With first foundations laid as recently as Feb., 1950, the project now houses more than 30,000 people. About 25% of the 154-acre shopping center was completed by the end of the year, including what is termed the largest suburban department store in the country.

• **Lehigh Portland Cement Co.**—$11.5 million plant at Bunnell, Fla., with a capacity of 1,400,000 bbl of portland cement, is expected to be in production by July 1. Included in this job are 24 storage silos 26 ft in diameter and 90 ft high.

• **Lever Brothers**—A $25 million Los Angeles plant was opened June 19, 1951, and hailed as the "largest industrial investment by private business in the history of Los Angeles County." It consists of six major buildings and facilities occupying one-third of a 30-acre plot. It produces soaps, detergents, and shortenings for eleven western states. Finish work is under way on Lever House, 21-story office building in New York City. And a $6,000,000 plant at St. Louis, Mo., will be placed in operation this summer.

• **Eli Lilly & Co.**—An antibiotics plant, estimated to cost $20 million, will be completed late this year at Lafayette, Ind. To produce penicillin and streptomycin, it will consist of ten buildings.

• **Lone Star Steel Co.**—Steel ingot production at the new $75 million plant in Lone Star, Texas, should start during the third quarter of this year and production of steel tubular products before the end of the year. Annual ingot capacity will be 500,000 tons, from which 350,000 tons of oil-country tubular products will be made in all commercial grades and sizes.

• **Metropolitan Life Insurance Co.**—The program of residential building begun four years ago on the West Coast will be completed by spring. Construction of Park labrea (4,253 apartments) in Los Angeles

(*Continued on page 93*)

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Don't be misled on this point when you are offered products of similar description and appearance made by other manufacturers. If you want dependable Richmond quality and performance, don't compromise with copies or substitution, call your shots—specify "RICHMOND".

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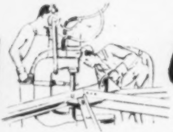

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(*Continued from page 90*)

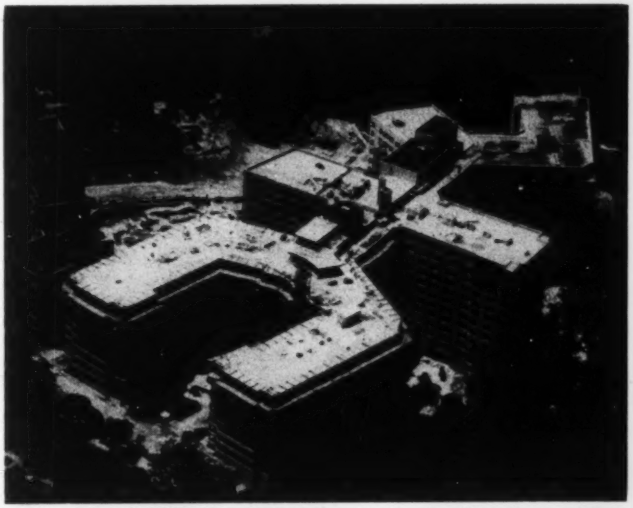
and Parkmerced (3,483 apartments) in San Francisco, which were stopped by World War II, was resumed in 1948. Instead of building 2-story apartment houses as originally planned, the company erected 13-story structures with reinforced concrete floors and walls; 18 were built in Los Angeles and 11 in San Francisco.

• **New York City Board of Education**—During 1951, construction was started on 19 elementary schools (18,429 pupils), costing $31,267,000; additions to 6 elementary schools (3,148 pupils), costing $6,460,000, including $686,000 for modernization of buildings; and 5 junior high schools (9,210 pupils), costing $14,138,000. Of these 30 schools, three will have structural steel framing, six mostly reinforced concrete but with some structural steel, and 21 all reinforced concrete framing. Also, during 1951, work continued on schools started in 1949 and 1950: 14 elementary schools (15,126 pupils), costing $19,810,000; additions to 5 schools (1,404 pupils), costing $3,883,000; and 2 junior high schools (4,046 pupils), costing $4,958,000.

• **New York City Housing Authority**—Completed in 1951: Bronx River, Colonial Park, Dyckman, Sedgwick, Boulevard, Parkside, Arverne, Ravenswood, Lexington, Astoria, Melrose, Farragut, Marble Hill, Pomonok and Breukelen Houses—15 projects containing 18,400 apartments—at a cost of $202 million. Still under construction but expected to be finished in 1952: Gov. Smith II, Stephen Foster, St. Nicholas, James A. Bland, Redfern, Edenwald, Throggs Neck, Bronxdale and Cooper Park Houses—nine projects containing 9,932 apartment—which will cost $151 million. Gov. Smith II Houses have structural steel frames; all others have reinforced concrete frames. Construction of 19 additional projects, with 21,500 units, is planned.

• **Onondaga County War Memorial**—Designed for multipurpose activities—concerts, drama, boxing, basketball, hockey—this $3,500,000 auditorium, completed last fall, has a thin-shell reinforced concrete barrel arch roof. With the arch supported on reinforced concrete cantilevers, the roof has a clear span of 204 ft. Outside dimensions of the building are 250x335 ft. The building is in Syracuse, N. Y.

• **PG and E Steam Plants**—The Pacific Gas and Electric Co. added a third generating unit, about 110,000 kw, to the $51 million Moss Landing steam plant beside Monterey Bay. At the $80 million Contra Costa plant at Antioch, a near twin of the original Moss Landing design, three units were installed, bringing in 340,000 kw. Two additional generating units are being added at each of these plants. Plans are under way for another steam plant in the Sacramento River delta area.



WOODNER APARTMENTS, in Washington, D. C., with 1,141 units, is said to be the largest apartment house in the world under one roof.

• **Park Forest (Ill.) housing**—Three-year-old Park Forest, Ill.—fastest growing housing development in the Chicago area—had a population of 15,000 at the end of 1951. About 12,000 persons live in rental units; the remainder own their own houses. Over $12 million worth of homes were sold last year. Owners have taken possession of 700 of the two and three bedroom ranch-type houses, which sold for $13,000 to $15,000, while 500 additional houses are under construction. In addition to a shopping center containing 120,000 sq ft of floor area, there are three schools, three churches, a 1,100-seat theater and parking space for 1,800 cars. This year's $25 million building program—emphasizing home construction, but including commercial, church and school construction—will advance the 475-acre town nearly to completion.

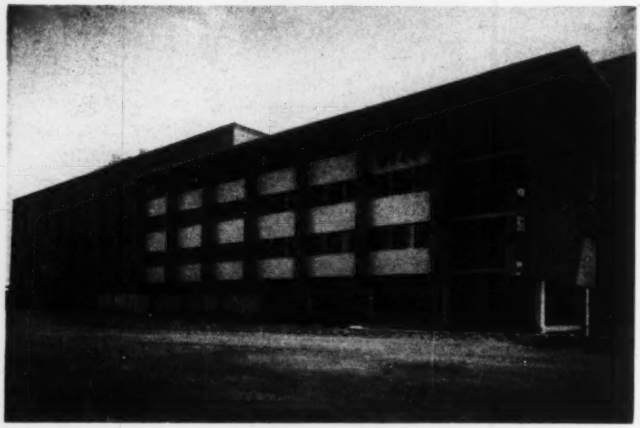
• **Republic Steel Corp.**—Plant expansions will be completed this year in four industrial centers. Steel-making capacity at the Cleveland, Ohio, plant will be increased 672,000 tons annually, at a cost of $75 million. A new seamless tube mill at the South Chicago plant will enable Republic to produce over 150,000 tons of seamless tubular products annually in sizes from 2⅜-in. through 9⅝-in. OD. A new byproduct coke plant at Birmingham, Ala., will contain 65 coke ovens, while 9,000 sq ft of working space are being added at the Massillon, Ohio, plant, including a new continuous annealing furnace and a caustic pickling unit.

• **Reynolds Metals Co.**—$80 million aluminum reduction plant, now under construction near Corpus Christi, Texas, will start producing aluminum pig this spring. Total annual capacity will be 150 million lb. A start is expected soon on a $42 million plant in San Patricio County, Texas, with a total production capacity of 1,000 tons of alumina per day. Completion is scheduled for Jan., 1953. An additional potline added at the Jones Mill, Ark., plant last summer, together with new pots added to existing lines, increased Reynolds' productive capacity by 50,000,000 lb of aluminum per year.

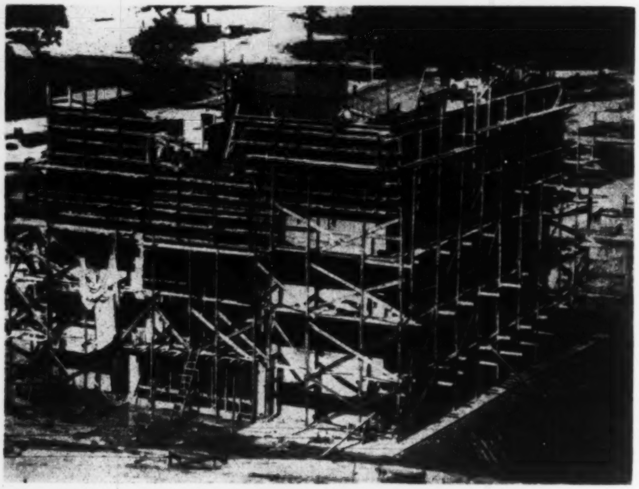
• **Statler Hotel**—Major construction was completed on the $23 million Statler Center in downtown Los Angeles. Finish work was under way at year's end, and completion is expected on schedule, July 1. The center includes a 14-story building for offices and shops as well as a 1,275-room hotel.

• **Stonestown**—The $15 million shopping center now being constructed to serve the new Stonestown apartment development in San Francisco includes two large department stores, medical building, three banks, supermarket, men's and women's specialty stores, and variety stores. It will be completed this summer.

• **Tennessee Valley Authority**—Five major steam plants are under construction: Shawnee (540,000 kw) on the Ohio River, 11 mi northwest of its confluence with the Tennessee River at Paducah, Ky.; Johnsville (675,000 kw) on Kentucky Lake, about 65 mi west of Nashville, Tenn.; Colbert (360,000 kw) on Pickwick Lake, in northwestern Alabama; Widows Creek (675,000 kw) on Guntersville Lake, in northeastern Alabama, 25 mi southwest of



SOAP FACTORY for Lever Brothers is reported to have required the largest capital investment for industrial construction in the history of Los Angeles County, Calif.



CYCLOTRON VAULT at Argonne National Laboratory has concrete walls 7 ft thick. Concrete was placed in alternate blocks to minimize effects of shrinkage.

Chattanooga, Tenn.; and Kingston (540,000 kw) on the Clinch River Arm of Watts Bar Lake, 35 mi southwest of Knoxville, Tenn. Operation of the first Shawnee unit is scheduled for next December, the next three units to follow early in '53. Two units of Johnsonville were started up last fall; four more are scheduled for this year. Colbert's two units are planned to begin operation in the latter part of '54. First four units of Widows Creek are scheduled to go on the line late this year; two more are planned for the first half of '54. And Kingston's four units will start operation in 1953.

- **Texas Medical Center**—Arabia Temple Crippled Children's clinic has just been completed as a part of this center in Houston. Construction of the M. D. Anderson Hospital for Cancer Research is well under way, and work has started on the Texas Children's Hospital and St. Luke's Episcopal Hospital, with completion planned by early '53. Bids for the University of Texas Dental Branch are being taken. Plans are well along for the Houston Academy of Music, Library of Medicine and Jefferson Davis Hospital for city-county charity patients.

- **Tishman Block**—One 100x150-ft office building is complete and occupied, a second has just been completed and a third nearly completed in a $12 million development on Wilshire Blvd. in Los Angeles. All three identical units are connected by a continuous ground floor building with a 465-ft frontage.

- **Titanium Metals Corp.**—A large World War II magnesium plant was reconverted to titanium production at Henderson, Nev. Within four months, this $14 million plant was in operation.

- **Triborough Bridge and Tunnel Authority**—A $3.5 million East Side Airlines Terminal and Public Parking Garage Building, in New York City, was placed under construction last July, with completion scheduled for April, 1953. The two-story reinforced-concrete and structural-steel frame structure, 200x400 ft in plan, occupies a full city block near the Manhattan Plaza of the Queens Midtown Tunnel. This location is convenient, since the building is both a ticket office and terminal for buses operating between Manhattan and La Guardia and New York International Airports. The roof, to be used initially for automobile parking, has been designed as a helicopter landing field.

- **Union Carbide & Carbon Corp.**—Construction is continuing on a $100 million ferroalloy plant at Marietta, Ohio, with 26 electric furnaces and a 160,000-kw power plant. More than 500,000 sq ft of precast concrete sandwich wall panels are being prefabricated to enclose the buildings comprising the plant.

- **United Nations**—The 4-story, steel frame Meeting Halls Building has just been completed. Cost of the superstructure alone was $12 million. Incorporated in the building is the equivalent of six full-size theaters—three large conference rooms and Security Council, Trusteeship, and Economic and Social Welfare Chambers. The General Assembly Building is expected to be finished by September. Equivalent in height to a seven-story building, it contains a large conference room and the General Assembly room.

- **U. S. Public Building Service**—At the $40 million National Institute of Health Clinical Center, Bethesda, Md., the $3,270,000 substructure of the main building and 55% of the $16,810,000 superstructure have been finished. The $5,120,000 boiler house is 16% complete, the $3,365,000 animal building, 3% complete; and the $2,880,000 shops-laundry-storage building, 50% complete. The District of Columbia Courts Building, which will cost $9,380,000, is 83% complete.

- **U. S. Steel Corp.**—Plant expansions to be essentially completed this year will add 2,500,000 tons of steel-ingot capacity annually, bringing the total added since the outbreak of the Korean war to 4,300,000 tons annually. Fairless Works in Morrisville, Pa.—now 35% finished—should start

(Continued on page 97)

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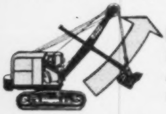

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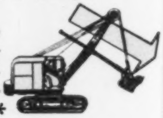
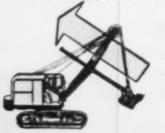
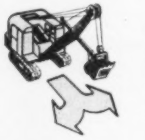


CROWD — Air-Assist — *requires less manual effort from the operator; reduces operator fatigue; Air keeps the crowd clutch applying digging power until the dipper breaks out of the bank.**



RETRACT — Air-Assist—*levers must be moved shorter distances — with reduced effort, to maintain clutch application.**



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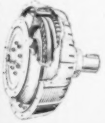

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VERTICAL BREAKS in brick facade of 42-story 1407 Broadway, New York City, make possible more corner offices.

(*Continued from page 94*)

initial ingot production during the second quarter of this year and reach full production of 1,800,000 tons annually during the third quarter. Additions to the Pittsburg, Calif., plant are 80% finished. Its enlarged cold reduction mill and electrolytic tinning line are expected to start operating the first quarter of this year; and the continuous sheet galvanizing line sometime during the second quarter of 1952. A new 160,000-ton-per-year open hearth furnace at the Geneva, Utah, plant should begin operating the first quarter of this year; and new facilities for producing hot-rolled sheets should go into production during the second quarter. New facilities for producing 500,000 tons of steel ingots annually at the Fairfield, Ala., works are expected to be finished early next year, and new sheet-making facilities by the third quarter of 1953.

- **University of California**—Of the university's $130 million postwar building fund for its eight major campuses, about $53 million was spent by the time the fiscal year ended June 30, 1951, and $88 million will be gone by June 30, 1952. Major projects brought to completion during 1951 included a $2 million jurisprudence building at Berkeley, and a $2 million construction program at Davis, including a food technology building and a resident hall. Biggest projects started last year and still under construction are the $10 million teaching hospital and $7 million medical science building in San Francisco; $14 million medical school, $2 million life science building, and $4.5 million geology and chemical building at the UCLA campus in Los Angeles; and a $3 million classroom building and $1.5 million virus laboratory at Berkeley.

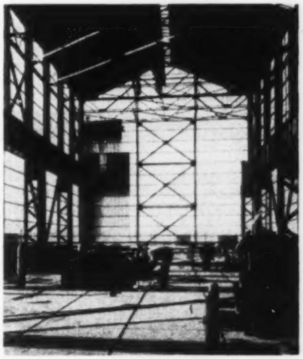
- **Utah Power & Light**—Highlight of a $68 million expansion program is the Gadsby steam plant in Salt Lake City. Costing $25.5 million, the first 66,000 kw was put on the line in 1951 and work started on an additional 75,000-kw capacity.

- **Valley Steam Plant**—One of the Far West's largest steam plants was started in September, 1951, when work began on the Los Angeles Department of Water and Power's $69 million plant in the San Fernando Valley. First 100,000 kw will be on the line in 1953 with the remainder of the 512,000-kw capacity to follow.

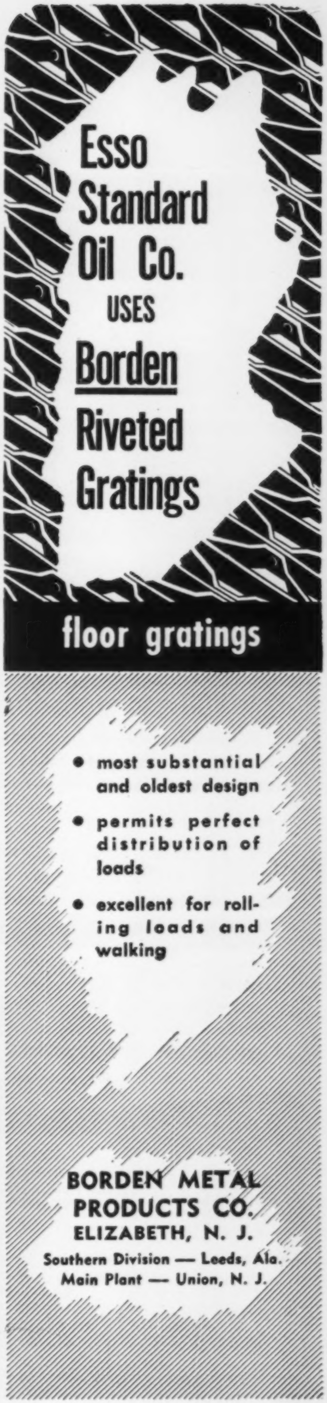
- **Veterans Administration**—Last year, 12 hospitals with about 5,000 beds were completed at a cost of $80 million. In 1952, 19 hospitals are scheduled for completion, providing about 10,400 beds at a cost of $200 million.

- **Westvaco phosphorus plant**—The Westvaco division of Food Machinery and Chemical Corp. commenced construction in mid-1951 at Pocatello, Idaho, on its fourth and largest electric furnace to manufacture pure phosphorus. It will cost $6 million and require 25,000 kw when it is completed and put into use late in 1952 or January of 1953. Westvaco's first three furnaces built at a total cost of about $12 million require altogether 50,000 kw.

- **Woodner Apartments**—Largest apartment house in the world under one roof, this $15 million building in Rock Creek Park, Washington, D. C., contains 1,141 apartments. It has a reinforced concrete frame; 7-in. solid floor slab of flat-plate design, with panels up to 18x22 ft; brick exterior walls and steel sash. It extends eight stories above one street entrance, and five stories below. Expansion joints divide the structure into three units. The entire building is air conditioned. Completion is planned for this May.



OPEN-HEARTH SHOP, part of vast U. S. Steel Corp. plant at Morrisville, Pa.



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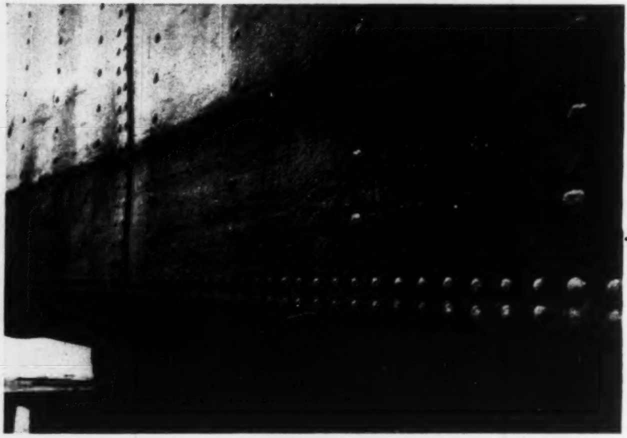

Photograph taken in July, 1950, shows coal barge, "Walling", which was zinc sprayed in 1933. Work done by Metalweld, Inc., Philadelphia, Pa. Note excellent condition of rivets and seams.

after 17 years in the Delaware River!

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THE LOS ANGELES CIVIC CENTER is now bypassed by the depressed portion of the Hollywood Freeway, opened to traffic late in December. Other portions of the job have been in use for a year.

Techniques and trends . . .

Transportation

THE GROWING SERIOUSNESS of traffic congestion on the nation's highways held the spotlight in the field of transportation during 1951. It found its origin in the steady growth of motor vehicle registration and in the continuing inability of the state highway departments to meet the needs of that growth.

Total motor vehicle registration rose from 49.2 million in 1950 to an estimated 52.2 million in 1951. As significant is the fact that total vehicle-miles rose an estimated four billion, bringing the total for 1951 to 500 billion. In and around many cities, the resulting congestion has become so bad as to be a serious handicap to commercial activities. And a disconcerting aspect is that the many access highways, built at great cost through metropolitan areas in recent years to provide traffic relief, actually have added congestion.

The result has been an increase in activities designed to provide more parking facilities in cities. An outstanding example is the 2,000-car parking garage under Pershing Square at Los Angeles. And the future of this type of project is impressive. Plans for parking garages are being made in San Francisco; Chicago has passed an ordinance authorizing a two-level garage for 2,500 cars under Michigan Ave. and Grant Park; Indianapolis is making an engineering study of facilities to park 2,400 cars in a garage built over the Erie R. R. tracks; and Boston plans a big garage under the Commons. Plans for a 17-story office building in New York include 31-story garage for 600 cars.

• **Highway building lags**—Road construction and reconstruction continue to lag far behind the country's actual needs, due chiefly to lack of funds, scarcity of steel and cement, and in part to the demand for engineers in defense work, which has outbid road departments.

Expenditure on highway building and modernization during the past year will probably total $1.2 billion. That compares with $1.9 billion in 1949 and $2.3 billion in 1950. The nation should be spending over $3 billion on highways modernization each year.

• **Roadbuilding plans expanding**—Plans to step up the pace of roadbuilding as soon as more men and materials

(*Continued on page* 102)

The world's greatest name in air entraining solutions!
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The Sam Mitchell State Office Building in Helena, Montana. Contractors: Dudley Construction Co., Helena, Montana. Protex concrete supplied by Helena Sand and Gravel Co. of Helena.

Photo showing work on Denver-Boulder Turnpike by Western Contracting Company. Protex Air Entraining Solution is being used in all of the concrete on this four lane super highway.

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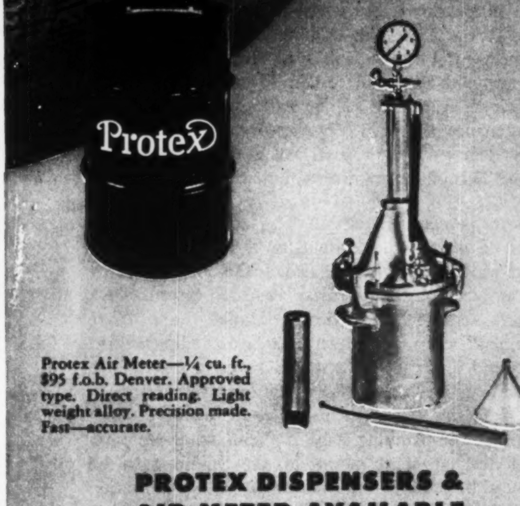

Protex Air Meter—¼ cu. ft., $95 f.o.b. Denver. Approved type. Direct reading. Light weight alloy. Precision made. Fast—accurate.

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NEWARK AIRPORT RUNWAY—Major airfield construction in 1951 took place mostly at military installations, but this is a civil project. It is runway A at the Port of New York Authority's Newark, N. J. airport, where filling operations are shown underway. Unstable subsoil required 510,000 ft. of vertical sand drains for consolidation. At right is the New Jersey Turnpike. (PNYA photo)

(*Continued from page 99*)

are available are taking shape. The American Association of State Highway Officials soon will ask Congress to increase the total federal aid for highways from the current annual figure of $500 million to $810 million for the fiscal years beginning July 1, 1953, and July 1, 1954.

Meanwhile, several of the states are making plans to increase the amount of money available for road and street work, either through bond issues or gas-tax increases or both.

Especially encouraging is the trend toward reviewing long-range highway plans by state highway departments to determine the minimum amount of work that must be done during the current emergency.

As a part of these reviews of long-range plans, some states are taking realistic looks to see what projects need to be scaled down from an ideal to a practical basis during the emergency.

• **Stage reconstruction of roads**—An outstanding example of this practical approach is the resurfacing of 600 miles of old concrete pavements undertaken in Iowa during 1951. The pavements are being resurfaced without widening because steel is not available to widen the bridges. Narrow bridges on such roads, if widened, would create bottle-necks potentially more dangerous than the narrow pavements.

Iowa's highway engineers estimate that, for a typical project of this kind, the cost of the work now being done is only one-fourth that of complete modernization. Also, 80% of the current work can be retained when complete modernization is undertaken.

• **More toll highways**—Toll road construction and planning rose to new levels during 1951. All of New Jersey's 118-mile toll turnpike, built at a cost of around $213,000,000, had been put into service by Jan. 15 of this year; Pennsylvania opened the 67-mile extension of its toll turnpike to the Ohio line, thus bringing the total length of that highway now in service to 327 miles, and Colorado put into service its 17.3-mile toll highway between Denver and Boulder.

Meanwhile New York put more sections of its thruway under contract, and at the November elections, the people of the state voted to pledge the state's credit to support $500,000,000 in bonds of the New York State Thruway Authority, thus making possible a material reduction in the cost of the work. Oklahoma began paving on its 88-mile toll highway between Tulsa and Oklahoma City, which expected to be completed by December of this year, while Ohio's plans for a 240-mile $300 million toll highway across that state were advanced to the financing stage.

Legislation providing for a direct connection between the Pennsylvania and New Jersey Turnpikes has been approved. Elsewhere, plans for toll highways are in less definite form in Virginia, Indiana, Florida and Massachusetts. Extension of the Maine Turnpike is under consideration.

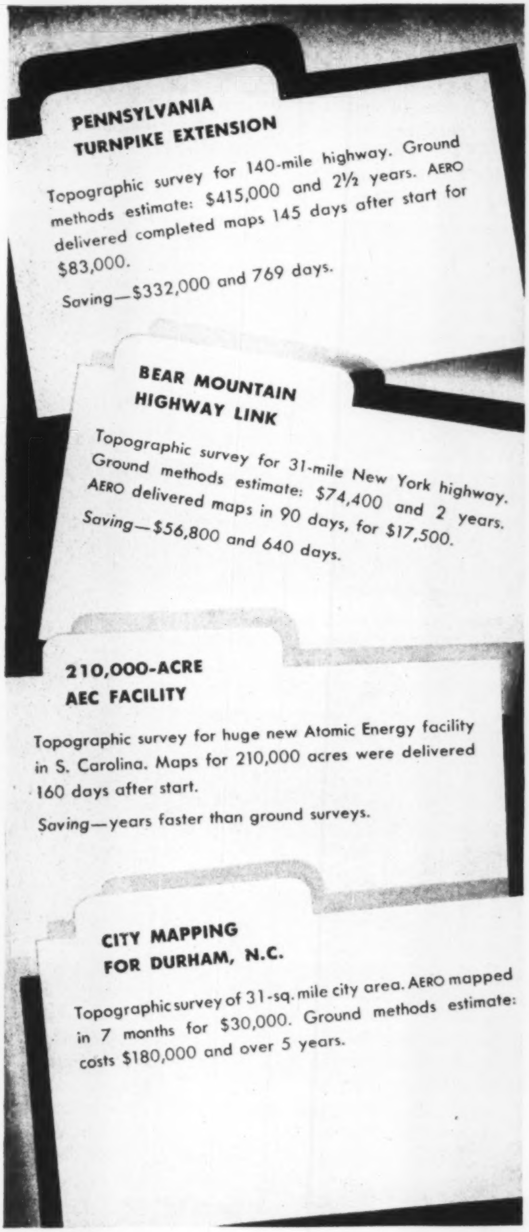
• **Paving types controversy**—Competition between the asphalt and cement interests for the distinction of having their particular type of paving adopted for these toll highways continued unabated during 1951. Asphalt was laid on most of the New Jersey Turnpike and on the Denver-Boulder highway, and asphalt was adopted for the paving work let in Oklahoma. But for the Ohio Turnpike, present plans are to use portland cement.

• **Reversed traffic flow**—Noteworthy in the Ohio Turnpike planning was a proposal to reverse the position of the traffic lanes—putting the eastbound lanes to the north side and westbound to the south of the central mall. This was advanced as a safety measure and to obtain certain advantages that could be gained by placing service stations, restaurants and maintenance shops in a widened mall between the traffic lanes. The proposal was seriously considered by the Turnpike Commission, but was not adopted.

• **More permanent tests**—A test to determine the effect of various truckloadings on a flexible-type pavement will be made near Malad, Idaho, in 1952 under the auspices of the Highway Research Board. Ten western states will participate. Unlike the concrete pavement test made under the board's direction in Maryland in 1950, this test will be on a newly built bituminous pavement. The Maryland test was on a pavement that had been in service for several years.

Still in the planning stage is a comprehensive pavement test at some point in the Midwest to be financed by states in the Mississippi Valley Association of State Highway officials. Plans are also taking shape for pavement tests at the headquarters of the Iowa

(*Continued on page 104*)



PENNSYLVANIA TURNPIKE EXTENSION

Topographic survey for 140-mile highway. Ground methods estimate: $415,000 and 2½ years. AERO delivered completed maps 145 days after start for $83,000.

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GEORGE WASHINGTON BRIDGE APPROACH—Access improvements for major vehicular crossings go on for many years after the big job is complete. Across a narrow band of Manhattan from the bridge itself, ramp construction shown here will serve a new bridge-approach tunnel under New York streets. (PNYA photo)

(*Continued from page* 102)

Highway Commission and at Newark Airport. In Iowa, a test track is to be built over which automatically controlled trucks will be operated to save the high expense involved in paying the truck drivers needed for round-the-clock operation. The Newark tests are being made on various types of flexible airfield pavements by the Port of New York Authority.

An extensive study of concrete for highway pavements also is under way in Kansas. Over thirty miles of pavement have been built under carefully controlled conditions to determine whether the durability of concrete paving can be improved by going back to the use of coarse-ground cement and by more careful selection of aggregates.

• **Railroads still form the backbone**—Staggering as are the figures for growth in highway traffic, it seems desirable to note that the railroads still form the strong backbone of the nation's transportation system. Even though, according to one set of figures, trucks moved 8.3 billion tons of freight in 1950, as against 1.5 billion tons moved by rail, if the freight-movement figures are converted into ton-miles—a better measure of transportation service—the rail contribution becomes 588.5 billion ton-miles as compared to 102.8 billion for the trucks. Last year the rail figure rose to 643.4 billion ton-miles.

Improvements of yards and terminals as a means for better handling of this growing volume of traffic made up the bulk of railroad construction work during 1951. Capital expenditures by the railroads, according to *Railway Age*, will total to $1.4 billion dollars, of which 25% went into roadway and structures.

New track built in this country was chiefly in line and grade revision work. It totaled 134 miles. Across the border, Canada is building the longest new railroad line built on this continent in many years, a 358-mile railroad to bring ore from the new iron deposits in northeastern Quebec and Labrador to a harbor on the St. Lawrence River.

Changes in sources of iron ore also are responsible for completion by the B. & O. R. R. at Baltimore of facilities for transferring 2,000 tons of ore per hour from ship to rail. Similar facilities to handle 2,400 tons are now being built by the Pennsylvania R. R. at Philadelphia. Both are primarily for South American ore.

• **St. Lawrence ship-canal plans**—The need for a ship channel above Montreal that will permit large ore vessels from the new Quebec-Labrador fields to reach ports on the Great Lakes is one reason for Canada's growing interest in the St. Lawrence seaways and power project. Consequently, when Congress again failed to take any definite action on that project, the Canadian government announced plans to build an "all-Canadian" project. These include an agreement with the province of Ontario to have its Hydro-Electric Power Commission pay Canada's share of the cost of the power facilities. Ontario needs the power badly.

What the Canadian government proposes is to build the navigation facilities on the Ontario side of the international section of the St. Lawrence instead of mostly on the New York side, as called for in the 1941 agreement that still is waiting action by Congress. But, even a canal wholly within Ontario could not be built without approval of the International Joint Commission. Also, the dam or dams required for power could not be built without approval of the U. S. Federal Power Commission as they would of necessity be partly in New York. Under the circumstances, it hardly seems probable that even this "all-Canadian" project could be started without at least tacit approval from the U. S. government.

• **Better airfield pavements**—In the ever-widening field of air transportation, a large amount of work was done during 1951 on Army and Navy airfields to make them adequate for the heavier wheels loads of today and for the flatter angle of approach of the heavier planes. Fortunately, experience has shown that the runways built before and during World War II were overdesigned—due to lack of practical experience. Experience gained since then has shown that many pavements built at that time for 15,000-lb axle loads can carry 30,000-lb loads with safety.

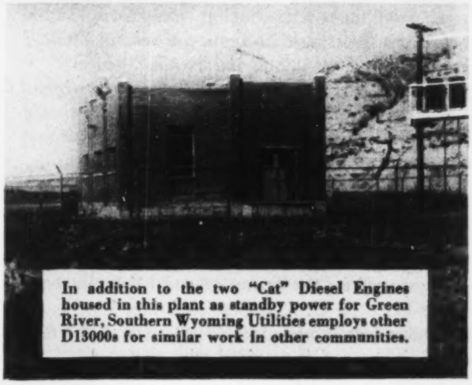
Much attention also is being centered on developing bituminous pavements better able to resist the shearing forces set up when a heavy plane lands and on finding paving materials that will not be seriously injured by fuel spillage or by heat from jet planes.

In civil aviation, the Civil Aeronautics Administration reported during the year that 2,288 new fields would be required under its National Airport Plan, and that improvements were needed at 2,657 existing

(*Continued on page* 106)

They saved the day when the regular power failed

Two "Caterpillar" D13000 Engines provide standby power for the Southern Wyoming Utilities water plant in Green River. Each develops 150 horsepower for maximum duty.



In addition to the two "Cat" Diesel Engines housed in this plant as standby power for Green River, Southern Wyoming Utilities employs other D13000s for similar work in other communities.

ONE of the most serious crises that can confront a community is the breakdown of its water supply. Lack of water for drinking, sanitation and fire fighting menaces health and property, so an effective preventive measure against this grim possibility is an invaluable investment.

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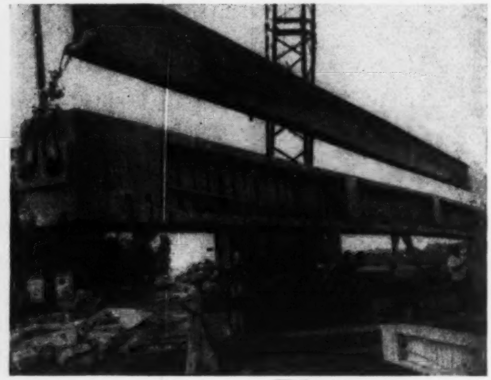


A YEAR FOR PRESTRESSING—In 1951, prestressed concrete for bridges passed from the talk stage to the action stage. This is a prestressed block-assembly beam for a bridge across Red Run Drain, near Detroit.

(*Continued from page* 104)

fields. Under the revised CAA program, only single runways will be built initially at new fields because of improvements in landing gear that permit crosswind landings.

Completion of the 1951 plan will require $323.7 million in federal funds and $338.3 million of local money.

• **Military airfield work**—Large as it is, this civil-fields program is surpassed by that for the military. Current work and work for which funds have been appropriated amount to about $4 billion—three fourths of it for the Air Force and the remainder for naval aviation. Naval work is at 30 domestic sites and at several outlying ones. Air force work involves more than 130 domestic sites and about 15 locations in other parts of the world. While some of the outside projects are secret, one of the biggest is a group of fields in Morocco. Cost of these fields alone is understood to be about $300 million.

• **Bridge work slowed by lack of steel**—In another transportation category , bridges, the picture was not so rosy. Bridge construction fell off in 1951. ENGINEERING NEWS-RECORD reported $304 million in United States bridge contracts for the year against $359 million for 1950. A cause of the shrinkage—reduced supply of structural steel—is expected to have still more pronounced effects on bridge building in 1952. At present most state highway departments are withholding predictions of over-all project completions because of the uncertainties of steel delivery for bridge work. One very important project that was delayed by the steel pinch was the New Jersey Turnpike. Principal hold-up was on steel for two large bridges between Newark and the George Washington Bridge. These bridges are significant because they include the nation's longest plate-girder spans. Continuous over the supports, each bridge contains a main span 375 ft long.

But these bridges are only two of several that figure in a move by eastern states to speed the flow of traffic along the Atlantic Coast. At the lower end of the New Jersey Turnpike, Delaware Memorial Bridge was opened in 1951, replacing a Delaware river ferry crossing and chalking up the world's sixth longest suspension span (2,150 ft). Farther south, the state of Maryland this year will complete its 4-mile Chesapeake Bay Bridge, which will allow coastwide traffic to bypass Baltimore and also tie the "Eastern Shore" of Maryland with the state's main body. And in Virginia, the York River Bridge, containing two long swing spans in tandem, will be open this year.

Steel shortages have not affected the Chesapeake and York River projects appreciably, because they were begun before the situation developed. But farther down the coast, at Jacksonville, Florida, it was necessary to get special help on steel procurement. Arlington and Gilmore Street bridges, part of a Jacksonville arterial system, were among the first projects to get supplementary CMP steel under U. S. Bureau of Public Roads sponsorship. Allotments were made because the bridges are needed for traffic generated by nearby naval air installations, but the over-all project also will speed north-south traffic through the city.

• **Biggest bridge prestressing job**—Another Florida project that got early CMP help was the 15-mi Lower Tampa Bay Bridge. While there are to be important steel structures in this project, the notable feature will be in the concrete portion. More than three miles of trestle will have prestressed concrete deck. Contractors now are setting up a "prestressing factory" at the site.

• **Increased use of prestressed concrete**—In October, 1950, the first prestressed concrete bridge in the U. S. was opened to traffic—a small structure in Madison County, Tenn., made of concrete block beams. In early 1951, the relatively large prestressed Walnut Lane Bridge in Philadelphia, Pa., was completed. After that, a rash of prestressed bridges seemed to break out: A pedestrian bridge was built in California, a highway bridge in Massachusetts, one in New York, 15 in Pennsylvania, four more in Tennessee, one in Florida, one in Texas, two in Illinois and two in Michigan.

In general, American engineers preferred to anchor the prestressing steel at the ends of their beams rather than rely on bond for anchorage. However, there was a definite trend toward grouting the steel in after the prestressing operation, to obtain some of the benefits of bond—greater factor of safety, better crack control, more protection against corrosion.

Two different techniques were prevalent. One—which was used for the Tennessee and Michigan structures—is based on U. S. suspension bridge experience. The steel is factory prefabricated into strands 0.6 to 1 in. in diameter and is provided with threaded-end fittings. The strands are easy to place. End anchorage is simple, but relatively expensive, since the cost of fittings is high. Stretched with a jack, the strands are anchored simply by tightening a nut on the fittings.

The second technique employs site-fabricated cables made up of wires about 0.2 in. in diameter. This follows European practice. Material costs are low; site costs vary with the type of end anchorage and local wage rates. Three variations were used last year:

(1) For the California pedestrian bridge and for roof beams in an Ohio building, button heads were pressed on the wires for end anchorage. Three to five wires were prestressed at a time.

(2) For the Walnut Lane Bridge, wires were prestressed two at a time by the Magnel method. The wires were gripped with wedges, both for jacking in the prestress and for end anchorage.

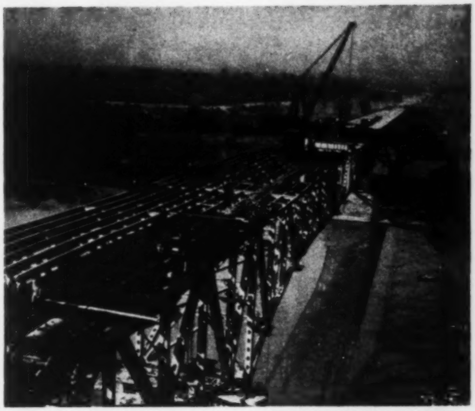
(3) For the New York bridge, complete cables were prestressed by the Freyssinet method. Wires were fastened to a double-acting jack with wedges. One action of the jack stretches the cable, and the second forces a conical plug into a conical opening in the end anchorage to wedge the wires into place.

The method used in Tennessee and Michigan, in which beams are made of concrete block is also significant. While little technological advance has been made in casting concrete in place to lower costs appreciably, improvements in block making have enabled unit costs to be kept low. Thus, rather large savings are possible with beams composed of machine-made block.

Prestressing was also applied to piles last year. Used in one case in the construction of an offshore oil-tank platform in the Quarantine Bay Area of the Louisiana Gulf Coast, the new-type piles consisted of precast 16-ft long, 3-ft dia hollow sections held together by high-strength steel wires. Sufficient prestress was induced to prevent the concrete from cracking under all conditions of handling. Test piles in other cases proved the feasibility of prestressing piles and later removing the steel for re-use after the piles are driven.

• **A bridge fails in Canada**—While prestressing was opening up a whole new frontier for concrete construction, steel took a minor setback early in 1951 when a continuous welded girder bridge near Three Rivers, Quebec, failed. At the time, the failure was thought to be due to the use of unduly brittle steel, which under accepted inspection procedures could have been used innocently. However, a commission appointed by Quebec's Premier Duplessis (after whom the bridge had been named) suggested two hypotheses for the rupture of one of the girders (the agreed point of initial failure): An unknown scientific cause or sabotage. While the findings cleared from blame all who were associated with the bridge's design and construction, the findings were regrettably inconclusive.

• **Welded box girders for bridges**—Welding techniques were expanded elsewhere, however. Notable is a pair of welded box girders 111 ft long that are the main members of a new bridge in King County, Washington. Similar welded steel box girders became the suspended span of a composite cantilever bridge in the same state later in the year. Cantilever arms are reinforced-concrete box girders.



PENNSYLVANIA TURNPIKE GROWS WEST—While new toll highways made progress in other states, the modern pioneer in the field was completed to Pennsylvania's western boundary in 1951. Biggest structure in the western extension's 67 miles is this cantilever bridge across the Allegheny river northeast of Pittsburgh. (Pennsylvania Turnpike Commission photo)

Other big-bridge business along the Pacific Coast in 1951 was confined to the planning stage. The Washington State Toll Bridge Authority continued investigating proposals for a Puget Sound crossing between Seattle and a point near the Bremerton Naval Shipyard. It already has been determined that the crossing will pay. Cost estimates are in the neighborhood of $70,000,000. Down the coast, a barrier to further San Francisco Bay bridges, as well as improvement to the existing bridge, was eliminated when a suit to prevent refinancing the San Francisco Bay bridge was withdrawn. If the suit had been successful it would have been necessary to make the present crossing toll-free (the bridge has paid for itself), and the owner, California Toll Bridge Authority, would not have had revenue to support progress on a second and third crossing. The second crossing, estimated to cost $46 million, is to span San Francisco Bay's northern arm, from Richmond to San Rafael. Detailed plans now are being drawn. In the meantime, interest waned in the controversial south bay crossing proposed to relieve congestion on the original Bay Bridge.

• **More vehicular tunnels**—Work progressed on two vehicular tunnels of the sunken-tube type tunnels at Portsmouth, Va., and Baytown, Texas. But tunnelers, with their eyes to the future, watched New York and Boston for up-coming activity. In New York, the Port of New York Authority announced it was ready to

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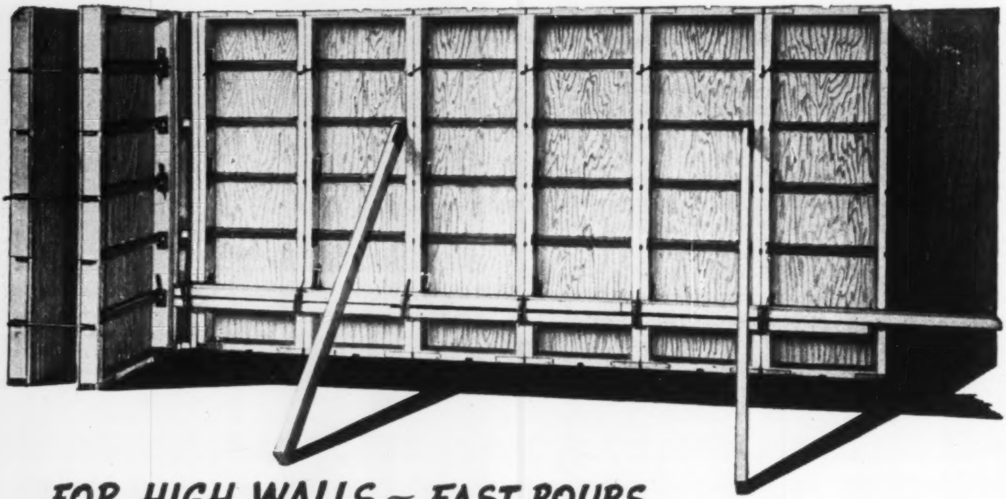

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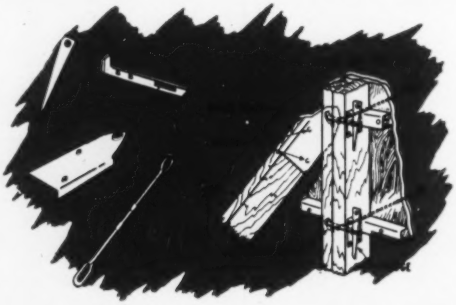

go ahead with an $85 million third bore for the Lincoln tunnel—already overloaded with trans-Hudson traffic. The project immediately bogged down in City of New York objections to the approach street system that would be necessary. Then, while continuing its fight for the third Lincoln tube, the Port Authority at year-end said it was ready to spend $200 million for still another vehicular tunnel under the Hudson somewhere between the Holland and Lincoln tube sites. Meanwhile, in Boston, Massachusetts Governor Dever asked the legislature for funds to build a second tube for Boston's Sumner tunnel. The present two-lane bore, already overloaded, soon will have improved accessibility as a result of the construction of new arterial routes at both ends.

• **New York subway plans**—Voters in New York state, at the November elections, paved the way for a start on New York City's Second Avenue Subway by approving a constitutional amendment to exempt $500 million in city bonds from the city's debt limit. Earlier in the year the city's Board of Estimate had approved tentative plans for a new 6-track subway under Second Avenue, with connections to existing lines in Manhattan, Bronx, Queens and Brooklyn. Chicago's 3.8-mile subway under Milwaukee, Dearborn and Congress streets was put into service, and work progressed slowly on extensions in Boston and Philadelphia. In Canada, contracts were let for final construction on the Toronto subway, first in the Dominion, and there was talk of a subway for Montreal.

In Cleveland the coming year will see a substantial start on a long-planned rapid-transit project. Eventually to extend 13.3 miles east-west between city lines, the new system calls for construction on rights of way owned by other railroads. The line's portion eastward from the Cleveland Terminal is expected to be complete in 1954.

• **Pipeline construction active**—Another mode of transportation is the pipeline. Lines for natural gas out of the Gulf Coast states continued to occupy a substantial part of the construction picture in 1951. And for the most part, steel was made available for the work. With the extension of lines northeastward into New England, one more major region of the United States was opened up for service with the cheap and useful fuel.

Now only the Pacific Northwest is not supplied. Power-short, that area is expected to get gas soon. But the source is likely to be nearby Canadian gas fields, rather than those of the Gulf Coast states. Early in 1951, the Alberta Petroleum and Natural Gas Conservation Board was disinclined to approve the export of gas to the United States, but during the year proved gas reserves increased markedly, and the board may look with greater favor on the proposition. A cloud in the picture, however, was the Federal Power Commission's refusal to grant a firm-flow export license that would enable the delivery of Texas gas to lower Ontario points, thus establishing the basis for an international fair trade on the resource.

Some Major Transportation Projects

• **Newburyport turnpike**—A major-bridge substructure and about half of the highway for this 23-mile relocation of the former toll road's upper end are under construction at a cost of $8,955,000. The road is a main coastwise route north from Boston. Overall cost estimate is $17 million. Work on the remainder will begin soon, for mid-1953 completion. The bridge crosses the Merrimack River upstream from Newburyport, Mass., tying in with a 3-mi. connection to the New Hampshire Turnpike.

• **Boston by-pass**—Running along a 22.5-mile arc west and north of Boston, all-new Route 128 was opened in August, cutting an hour off travel time for motorists going from lower New England to points north of Boston. Cost was $17,800,000.

• **Boston vehicular projects**—Boston's **Central Artery**, which will ease traffic in the city's heart, got a good start in 1951, $17.6 million out of an estimated $60 million in contracts now being under way. These contracts cover a **bridge** across the Charles River and connections to the Mystic River Bridge, downtown Boston and to **Embankment Road.** The last-named is a 2.5 mile route that was completed in 1951 at a cost of $11 million. It runs on new location along the Charles' right bank. Northwest of the city's center is bottlenecked **Sullivan Square,** where a $4.8 million street grade-separation improvement will be complete this summer. The $8.3 million **East Boston Expressway** (2-mile connection between Sumner Tunnel and Logan airport, as well as north-shore points) will not be complete until the end of 1953.

• **Olneyville Expressway**—Providing a by-pass for a serious through-traffic bottleneck in an outlying Providence, R. I. business center, this expressway has total pavement equivalent to 4.14 miles of 2-lane roadway. To cost $8.4 million, it is two-thirds complete.

• **Port of New York Authority Vehicular Projects**—The $7.5 million 179th St. tunnel, which with its approaches provides improved New York access to George Washington Bridge, was 95% complete at year-end. A half-mile two-lane tunnel parallels an existing tunnel. There have been 14 contracts in this project. Six Port Authority contracts and one New Jersey Turnpike Authority contract were 70% complete in the project to connect the **Lincoln Tunnel** with the **New Jersey Turnpike,** west of the tunnel's existing depressed way connection across Union City, N. J. Contracts, amounting to $3.3 million will be substantially complete soon.

• **New York Thruway**—Big news on this east-west New York toll highway was the approval in November of a constitutional amendment permitting the state to pledge its credit to $500 million in Thruway bonds. During 1951 Thruway mileage open to traffic increased from 13 to 42. Work is under way on 56 miles, a figure that will increase to 98 by spring. Total proposed mileage is 535.

• **Buffalo vehicular routes**—A combination of projects eventually will speed traffic 18 miles along Lake Erie and the Niagara River, from Lackawanna past downtown Buffalo, N. Y., to Grand Island. Key is a **high-level bridge** over Buffalo river and canal, now in the foundation stage. An-

EXPRESSWAY CONSTRUCTION costing $3,600,000 was placed under contract last year in Houston, Texas by the State Highway Department.

other link, **Terrace grade crossing elimination project**, is more than two-thirds complete. Here, at a cost of $4.2 million, the state of New York is relocating two main New York Central Ry. tracks by placing them underneath the vehicular route. Just north of the Terrace project a mile of the **Niagara Thruway** was opened in 1951. The remaining seven miles of thruway, northward, is in the planning stage.

• **New Jersey Turnpike**—All but nine miles of the 118-mile New Jersey toll turnpike were in operation at the end of 1951, and the remaining section went into service during January. Because of increased land and construction costs, an additional issue of $35 million in bonds was approved during 1951, bringing the total to $255 million. Construction and land costs will total around $213 million. Two important bridges, across the Hackensack and Passaic rivers, contain the longest plate-girder spans (375 ft) yet built.

• **Schuylkill expressway**—To connect Philadelphia with the Pennsylvania Turnpike's eastern terminus at King of Prussia, this 17-mile four-lane divided highway, with three bridges across the Schuylkill in Philadelphia, will cost $80 million. So far, $17 million has been obligated for about 11 miles outside the city; this includes a 9-mile stretch which was opened in 1951. Work in Philadelphia to University Circle remains to be placed under contract.

• **Pennsylvania Turnpike**—On Dec. 26, 1951 the 67-mile western extension of the Pennsylvania Turnpike was opened. This brought to 327 miles the turnpike's total length. Cost of the western extension was $77.5 million. For the time being western exit is at Gateway, about two miles short of the Ohio line. A new 2-lane road ties in with existing Ohio roads pending Pennsylvania Turnpike connections with the Ohio turnpike when that road is built.

• **Penn-Lincoln parkways**—In the Pittsburgh area, the first 7 miles of **Penn-Lincoln Parkway East** is nearly complete, and will be opened this year. The next 1.1 mile is under contract, 40% complete. This leaves 2.3 miles, including the Downtown Interchange. To keep a railroad in operation, this last work must be done in 11 stages. Work should begin this year. **Penn-Lincoln Parkway West**, leading to the new Pittsburgh airport, is 9.2 miles long. Under contract, its completion date is uncertain because of steel-delivery uncertainties. Work began in 1950, and contracts amount to $14 million.

• **Delaware Memorial bridge**—Crossing the Delaware River at the New Jersey Turnpike's lower end, a few miles south of Wilmington, Del., this sixth longest suspension bridge (2,150-ft main span) was opened to traffic in August, 1951. It provides 4 lanes.

• **Chesapeake Bay bridge**—To cross more than four miles of open water, this $44 million two-lane bridge near Annapolis was 75% complete at year-end. Completion is scheduled for July 1, 1952. Construction has featured the erection of truss and cantilever spans at an on-site stage, and floating them into place. The bridge includes a 1,600-ft main suspension span.

• **Baltimore-Washington expressway**—A modern substitute for U. S. Route 1, this limited-access route is a project of the State of Maryland and the U.S. Bureau of Public Roads. Maryland's share, 10.2 miles (plus 8.2 miles of connections) will cost $14.5 million. It is fully obligated and is 75% complete. The federal share, 15.5 miles, has grading complete for 6 miles; 6½ miles of grading and nine bridges now are under construction.

• **York River bridge**—Outstanding feature of this $9 million highway toll structure in Virginia is a pair of 500-ft swing spans in tandem, which provide a 450-ft wide channel opening. At year-end, overall completion was 92%, with opening scheduled for April 15, 1952.

• **Norfolk-Portsmouth bridge and tunnel**—The bridge portion crosses the east branch of the Elizabeth river; the tunnel crosses the south branch. Together they will connect two of the East Coast's important naval facilities, eliminating a ferry crossing. On Jan. 1 the project was about 85% complete, for spring 1952 opening. Construction cost is $17.1 million. Tunnel includes 2,117 ft of sunken-tube sections, 2,133 ft of cut and cover. Bridge is 2,135 ft between abutments. Connecting land transition link in Berkeley, Va., is about 1,500 ft long.

• **Jacksonville bridges**—Part of an expressway system now under construction in Jacksonville, Fla., are Gilmore Street bridge and Arlington bridge, both over St. Johns river. The former, 3,666 ft long, costs $5.3 million and includes a double-leaf bascule span with 174-ft clearance. It is 10% complete. Arlington bridge is 7,375 ft long, and costs $11.3 million. It is 50% complete.

• **Lower Tampa Bay bridge**—Construction for this $15 million 15.1-mile two-lane crossing of Tampa Bay's (Fla.) mouth was 88% under contract in 1951. The largest contract, $7.6 million, involves 17,352 ft of trestle approaches and 32 piers containing 53,000 cu yd of concrete. Factory-built prestressed beams will be a feature of the trestle work. Two channel spans will be a twin-leaf bascule and a 1,584-ft cantilever bridge. Construction will be complete in 1954.

• **Ohio Freeways**—Two freeway contracts were awarded last year in Ohio. One is a 6-lane limited-access highway, 0.82 miles long, in Akron. Project cost is $3.2 million including $1.6 million for right-of-way. The second project—between Elyria and Lorain—involves 3.06 miles of four-lane divided limited-access highway and adding two lanes of pavement to 1.19 miles of existing two-lane pavement. Project cost is $1.4 million including $275,000 for right-of-way. Freeway construction completed last year includes: $3.2 million in Cleveland; $798,000 in Akron; and $487,000 in Cincinnati. This year the

(Continued on page 114)

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Ham & Timmer's 2 D Tournapulls move

Pusher-loaded in hard-to-dig "sugar" sand, each D Tournapull picked up 5.5 pay yards in an average loading time of 30 seconds.

Hauling 1200′ to fill, and returning up 1500′ of 0 to 9% grade, the 2 "D's" averaged 10 m.p.h. round trip . . . delivered a total of 26 loads, 142 pay yards hourly.

With big, low-pressure 65″ and 56″ wide base rim tires and power proportioning differential "D's" had plenty of traction and load flotation to help lick this 100,000-yd. sand job.

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1420 yards daily on 2700-ft. cycles

To prepare a real estate site at Grand Rapids, Ham & Timmer of Grandville, had to move 100,000 yds. of pure Michigan blow sand. Material was extremely abrasive, tough to load . . . and so loose and shifting under foot that it created 200 to 250 lbs. rolling resistance. Ham & Timmer started the job with 2 crawler-scraper rigs . . . then to help put production on schedule, brought in their 7-yd. D Tournapull. The contractors were so pleased with its performance in the tough going, that they bought a second electric-control, 122 h.p. Tournapull.

Average 2700′ cycle every 4.5 min.

Each pusher-loaded "D" heaped 5.5 pay yds. in an average of 30 seconds. On a typical 2700′ cycle, each rig completed 13 trips . . . delivered 71 pay yards per hour. Combined production for the two Tournapulls, amounted to 142 pay yards hourly, or an average of 1420 pay yards during every 10-hour day.

"100% satisfied . . ."

On this job, the owners figure "95% plus" operating efficiency for the two rubber-tired units. G. J. Ham, partner, speaking of their Tournapulls, says . . . *"We're 100% satisfied. The 'D's' move dirt faster and cheaper per yard than any equipment we've ever owned . . . will go loaded where crawler equipment won't go empty."*

You'll be surprised, too, at the big hourly yardages and low cost per yard you can get with D Roadster Tournapulls on both production and maintenance-type dirtmoving jobs. Ask your LeTourneau Distributor to show you other owner-verified reports of the "D's" performance on work similar to your own. He will be glad to prove performance on your job by a demonstration.

Tournapull—Trademark Reg. U. S. Pat. Off. DP618

R. G. LeTOURNEAU, Inc., Peoria, Illinois

BUFFALO GRADE ELIMINATION—Railroad grade-crossing elimination programs continued in many states during 1951. This is a new depressed location for the New York Central Railroad in Buffalo, where a new arterial route is being built along the Lake Erie front. (N. Y. State Dept. of Public Works photo)

(*Continued from page* 110)

State Highway Department expects to award $3,350,000 of substructure contracts for the Maumee River bridge in Toledo, and $4.2 million of other construction in the Toledo expressway system; another 1.2-mile 6-lane section of Akron expressway for $6.5 million; and 2.5 miles of 8-lane divided pavement including service roads and three interchanges, on the Memorial Shoreway in Cleveland, for $6.5 million.

- **Cleveland (Ohio) bridges**—Two of the 7 bridges in the railroad bridge-replacement program over the Cuyahoga River will be finished this year. Contracts are expected to be let this year for two others (N.Y.C.R.R. and the C.C.C. & St.L. R.R.), but the other three are in the future. The W.&L.E. bridge is 82% finished. Construction of the lower C.C.C. & St.L. bridge—now 45% finished—is being slowed up by the difficulty of securing operating motors, generators and electrical controls. Contracts are executed by railroads after entering into a cost-participating agreement with the federal government through the Corps of Engineers.

- **Detroit expressways**—The successful sale last year of an $80 million bond issue against future automobile taxes will speed construction of Detroit's two expressways, shortening the length of time required to complete them by at least four years. The Board of Wayne County Road Commissioners expects to award contracts and purchase right-of-way totaling $16.3 million this year for the 5.5-mile second section of the north-south **John C. Lodge expressway.** This is more than three times the amount of contracts awarded last year on the 3.5-mile first section, which totaled $4.5 million. Contracts completed last year totaled $1 million; while $1 million worth of work awarded prior to 1951 was nearing completion at the end of the year. The Michigan State Highway Department awarded 11 construction contracts totaling $1.5 million last year for the 5.5-mile east-west **Edsel Ford expressway.** Work completed by last November 1 totaled $4.8 million. It included 2.95-miles of 6-lane divided pavement. This year the state highway department expects to award $10 million worth of contracts on the project, which is 20% complete. Funds expended to date on the two expressways total $21.3 million for construction and $22.6 million for right-of-way.

- **Chicago, Ill.**—Ten contracts were awarded by the Department of Subways and Superhighways last year for $4.7 million of superhighway construction. Nine were on the **Congress Street Superhighway** (West route); one was for **Wacker Drive** extension. Construction programmed for this year—estimated to cost $15.1 million—will embrace contracts for additional Congress Street construction and Wacker Drive extension, and on the North and Northwest routes in the city's comprehensive superhighway system.

- **Chicago bridges**—Considerable new bridge construction and improvement is planned for this year, depending upon the availability of steel. It includes: the $3.3 million superstructure for the new Congress St. twin bascule bridge over the Chicago River, awarded late last year; two new bridges over the river at Halsted and Van Buren, each to cost $2.5 million.

- **Missouri expressways**—Contingent upon the availability of structural and reinforcing steel, the Missouri State Highway Department plans on letting six construction contracts this year on the **Third Street Trafficway** in St. Louis. Estimated to cost $8 million, the work will include: a $4.7 million viaduct; 0.32 miles of multilane pavement, $2.3 million. Two contracts totaling $1.4 million, awarded last fall for sewer construction and railroad track removal in connection with the trafficway, will be completed this year.

- **Bay St. Louis bridge**—Work is just getting underway on this $6.1 million bridge, in lower Mississippi just off the Gulf of Mexico, to carry U.S. Highway 90 across the bay. Completion is scheduled for June 1953. The 10,200-ft structure will be made up of a 124-ft double leaf bascule flanked by two 75-ft wide-flange beam spans. There are 241 concrete-girder approach spans, each 41 ft long, supported on precast concrete pile bents. Precast concrete piling also will support the four central piers. The bridge will carry two 26-ft roadways separated by a 3-ft median, and a sidewalk on each side.

- **Baytown tunnel**—One contract was completed and another one awarded last year for construction of the Baytown-LaPorte tunnel to carry Texas State Highway 146 traffic under the Houston Ship Channel. A contract for the hydraulic embankment and 2,664 ft of 35-ft dia precast tube section was completed at a cost of $5.3 million. A $3.9 million contract was awarded by the Texas State Highway Department last September for 0.6 mile of cut-and-cover section of the tunnel, including the ventilation building with mechanical and electrical equipment, tunnel paving, tile lining, and lighting.

- **Texas expressways**—Sixteen major contracts were awarded last year by the Texas State Highway Department for expressway construction in its six major cities. Costing $13.7 million and representing 14.4 miles of expressways, the contracts included storm sewers, lighting, grade separations and other structures in addition to grading and surfacing. Contracts completed last year totaled $4.7 million for 4.4 miles, of expressways. This brings the state's total investment up to $34.3 million for 25.7 miles of completed expressways. Thirteen major contracts are expected to be let this year for expressway construction in 7 Texas cities. They are: **Houston,** 0.4 mi.; **Dallas,** 0.9 mi.; **Ft. Worth** 0.4 mi.; **San Antonio,** 0.6 mi.; **El Paso,** 0.4 mi. **Waco,** 1.3 mi.; and **Beaumont,** 0.2 mi.

(*Continued on page* 117)

STANG WELLPOINTS DRY EXCAVATION 17' BELOW GROUND WATER LEVEL

Workman digging in dry heading. Stang wellpoints at lower left and right.

Looking from heading toward open shaft in tunnel. Header at left. Dry soil 400' away from the pump.

In 1951 the City of Long Beach, California, constructed an outfall sewer to relieve a congested sewerage system. This work involved 8,000 feet of plate-lined tunnel. The tunnel bore was excavated in soft ground from shafts 40 feet deep, the ground water level averaging 2 to 3 feet above the roof of the tunnel. The invert was 10' below ground water level and pits were dewatered up to 7' below the invert. Stang wellpoints were installed along a header line in the tunnel to pump 17' of water. A Stang electric pump, located above the tunnel roof over the portal of each section, operated the header line in the shaft as well as in the tunnel. Result—dry ground all through the tunnel, right up to the heading.

Portal of one tunnel section, showing Stang electric pump above the roof.

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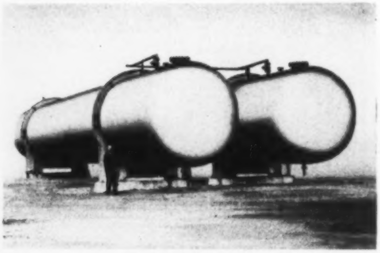
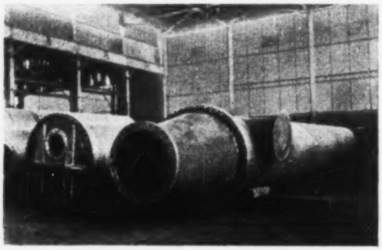


Posey Iron Works twin-tank installation for prominent public utility.



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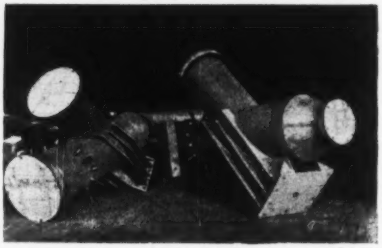

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(Continued from page 114)

- **Oklahoma Turnpike**—Plans have been completed on 86½ miles of grading and drainage; 84 miles of pavement; and 58 of the 68 bridges on the 88-mile toll highway connecting Oklahoma City and Tulsa. The entire project is scheduled for completion by Dec. 1 of this year. The two 24-ft pavement lanes—separated by a 15-ft raised median—are being built. Contracts awarded last year include: 24 grading and drainage contracts for 84 miles, totaling $9.4 million; fifteen contracts for paving 84 miles, totaling $9.3 million; 42 bridges for $4.1 million. Contracts to be awarded this year include 26 bridges estimated to cost $4.1 million.

- **Denver Valley Highway**—One additional mile, including the 18th St. interchange, was completed last year under a $567,000 contract; providing 3 miles of completed north-south freeway in Denver. Denver spent $1.5 million last year for the purchase and clearing of right-of-way. State funds will provide $862,000 for right-of-way and $708,000 for construction this year. This will permit the construction of a short section of highway near West 23rd Ave which, when completed, will provide a continuous north-south truck route through Denver.

- **Denver-Boulder Turnpike**—This 17.3-mile toll road between Denver and Boulder, Colo., was substantially completed at the end of 1951. Costing $6 million, it cuts 8 miles off the distance between the cities.

- **California Freeways**—Freeway construction in California continues at a rapid pace except that materials shortages are slowing progress on bridges and interchanges. Completed and open to traffic in 1951 was 19.6 miles on seven freeways that involved 1951 expenditures of $21 million. This included 5 miles of the **Hollywood Freeway** and 7.9 miles of the **Santa Ana Freeway**. Contracts in effect but not complete at the end of 1951 are **Hollywood Freeway**, 1.8 miles, $7.6 million; **Santa Ana Freeway**, 9.7 miles, $10.7 million; **Ramona Freeway**, 4.1 miles, $6.8 million; **Harbor Freeway**, 0.6 miles, $2.9 million; **Bayshore Freeway**, 0.7 miles, $3.7 million; **Eastshore Freeway**, 9.9 miles, $8 million; **Los Angeles River Freeway**, 2.5 miles; $1.8 million; **Colorado Freeway**, 0.7 miles, $4.1 million; and **Montgomery Freeway**, 3.8 miles, $1.5 million. These figures are for freeways with four or more divided traffic lanes.

  Routes of the major freeways are: Hollywood and Santa Ana Freeways extend from North Hollywood through the heart of downtown Los Angeles to Santa Ana; Harbor Freeway extends from downtown Los Angeles to the San Pedro harbor area; Ramona Freeway extends east from Los Angeles to Pomona; the Eastshore Freeway extends from the Carquinez Bridge along the east side of San Francisco Bay south to San Jose (passing the east end of the San Francisco-Oakland Bay Bridge); the Bayshore Freeway extends from the west end of the Bay Bridge along the west side of the Bay and runs south to San Jose; the Montgomery Freeway extends from San Diego to the Mexican border; Colorado Freeway extends from Pasadena to Glendale; and the Los Angeles River Freeway extends from Long Beach to the Santa Ana Freeway following the Los Angeles River.

- **Arroyo Seco bridge**—Now 30% complete, this six-lane concrete arch structure will carry the Colorado Freeway over Arroyo Seco in Pasadena, Calif. Construction cost is $3.6 million, with right-of-way running to $400,000.

- **Division Street interchange**—Part of the Bayshore Freeway in San Francisco, this welded-steel structure includes two main elements, one 2,337 ft long (37 spans) and the other 2,685 ft long (44 spans). Progress is 15% toward 1953 completion. These elements cost $3.5 million for construction and $1,500,000 for right-of-way. Future work on other elements will bring the interchange's total cost to $20 million.

- **Broadway Tunnel**—San Francisco's $5,253,552 vehicular tunnel is 55% complete with pilot bores holed through and work under way on full face excavation. The 1,616-ft-long tunnel scheduled for completion late this year will speed traffic flow from downtown to the western portions of the city and to Golden Gate Bridge.

- **Columbia River highway**, Cascade Locks to The Dalles—Undertaken to replace an obsolete section of highway built between 1917 and 1922, this 40-mile project is estimated at $16.3 million. Construction includes, in addition to grading and paving, five bridges, two highway grade separations and four railway grade separations. Roadbed construction involves heavy rock excavation and some 4,500,000 cu yd of hydraulic dredge embankment. Construction began in 1951 and by January 1, 1952, nine contracts, totaling $9.6 million, had been awarded. Construction is being financed in major part with bond funds. Completion is planned for the fall of 1954.

- **T. H. Banfield expressway**—This four-lane expressway, 14 miles in length, will extend from the heart of Portland, Oregon, east to Troutdale. For 5.8 miles the project parallels the Union Pacific Railroad in a natural depression, locally known as Sullivan Gulch, providing full separation of the expressway from intersecting streets. Costs are estimated: $5.9 million for right-of-way; $2.5 million for grading; $3.2 million for structures; $4.2 million for paving; and $250,000 for landscaping—a total of $16 million. Acquisition of rights-of-way is well advanced with 291 of the 329 properties involved having been either acquired or optioned. First of the construction contracts was awarded on Sept. 7, 1951; $350,000 for grading and paving of 1.4 miles at the easterly end. An additional $2.2 million is to be contracted in 1952.

- **Coos Bay-Coquille highway**—Relocation and reconstruction of the Oregon Coast Highway (U. S.-101) between Coos Bay and Coquille will involve 18 miles of grading and paving and the construction of five bridges. It will provide a four-lane roadway from Coos Bay to a point 3.2 miles north of Coquille and a wide two-lane roadway from that point into and through Coquille. Cost is estimated at $4.1 million, with the last of ten contracts awarded in January, 1952. Completion is scheduled for 1952.

- **U. S. 99 in Oregon**—Modernization continues on two major sections of Oregon's most important highway—the north-south U. S. 99. Completion of an 11.2-mile section near Canyonville is scheduled this year. The heavy rock excavation in the narrow Canyon Creek gorge ran the cost to $2.8 million with $1 million of this federal forest highway funds, another $300,000 federal aid funds and the balance state funds. Work is just starting on another major unit of U. S. 99 between Eugene and Roseburg. A 19.6-mile section will be realigned between Divide and Rice Hill, saving 2.4 miles. First contract for 5.6 miles of grading and paving was awarded late in 1951 for $1.5 million. Some $1¼ million more is scheduled for letting early this year.

- **Alaskan Way viaduct**—Work was started in 1951 on the second $3.7 million section of the $10 million Alaskan Way viaduct, designed to bypass the main business district of Seattle, Wash. A $1.1 million contract for the third and final section of the double-deck viaduct was awarded late in the year and a bid call is scheduled early in 1952 on a $2.3 million vehicular subway, Seattle's first, to connect the north end of the viaduct with the main highway out of the city. Completion of the viaduct proper is scheduled for next November with the subway to follow later.

- **Honolulu, T. H.**—A 1.9-mile approach road costing $1.2 million is complete as the territory starts work on its long-delayed **tunnel project** to speed traffic from Honolulu to its built-up suburbs in windward Oahu, across the famed Nuuanu Pali. An additional mile of the four-lane, divided asphaltic concrete highway is under construction at a cost of $1 million. Plans for a single $5.6 million tunnel have been shelved in favor of several smaller tunnels but litigation over rights-of-way on the Honolulu side continues to delay actual construction. A 7.5-mile $9 million **waterfront arterial highway** should be completed this year. About 5.5 miles of the six- and eight-lane asphaltic concrete thoroughfare is already complete. The remaining 2 miles is under contract at a total cost of about $5.1 million. Bids will be opened in February on the first section of a parallel arterial, running across the city a mile back from the sea.

• **Hilo, T. H.**—The 40-mile, 24-ft-wide Hamakua coast industrial highway now is scheduled for completion in 1953, with cost estimates raised to $16.5 million. So far, 17.1 miles has been finished at a cost of $6.1 million. Construction is under way on another 7.2 miles, costing $5 million. During 1952, the territory expects to contract for another 6.3 miles, costing about $2.2 million. The route is along a high, gulch-pocked coast in the sugar area with 40 major and several minor bridges required. Rainfall up to 270 in. a year impedes work.

• **Iron Ore railroad**—In the railroad category, one project is outstanding. It is the 360-mi single-track line that will connect new ore fields in Labrador with Seven Islands, Que., on the St. Lawrence River. 1951 was the first season of full-scale construction. A feature of the work was air transportation of construction equipment to wilderness sites along the route. Grading was completed on almost half of the route in 1951, with railroad operation scheduled for 1954.

• **Toronto Subway**—The final contract for Canada's first subway, covering about a half mile of the project's 4½-mile length, was let in November for $3.2 million. Also let in 1951 was a $4 million contract for station finish. This brings the obligated total to $27 million. The first mile of subway is 92% complete. The second contract, 1.3 miles of subway and .9 miles of open cut, is 65% complete. Third: 0.6 mi., 25% complete. Overall completion is expected by the end of 1953.

• **New York subways**—Only major project under way in 1951 was an underground connection between Independent and BMT divisions at Queens Plaza, to allow Independent trains to operate through BMT's uptown East River tunnel. Structure work, to cost $7.2 million, was 40% complete at year-end, for mid-1953 completion. In November New York State voters amended the state constitution to allow the city to borrow $500 million beyond its debt limit, for construction of a Second Ave. subway and other transit improvements.

• **Harlem River bridge**—Foundations for this four-track lift bridge were begun in 1951 for end-of-1952 completion. Lift span will be 340 ft. long, providing 225-ft channel width and 135 ft vertical clearance. Will replace a swing bridge that carries all Grand Central Terminal traffic. Total cost: $10 million. Overall completion: 1956.

• **Philadelphia subway**—The Market St. extension westward from City Hall to 46th St, to replace an elevated line, came closer to completion with year-end progress of 75% on the 42nd-46th St. contract, which is a transition, from previously-built structure underground, to the elevated line. The line will remain elevated west of 46th St. Only link remaining is a short tie-in piece at the eastern end. This work may begin in 1952.

• **B&O Tunnel No. 1**—Notable chiefly for difficult driving through old mine workings, this 0.6-mile double-track tunnel was 70% complete at year-end, will be ready for traffic this summer. Near Clarksburg, W. Va., it replaces a century-old single-track bottleneck in an otherwise double-tracked line.

• **New York airports**—Principal airport work conducted during 1951 by the Port of New York Authority was conducted at **Newark Airport.** There, $3.5 million was spent on the first two runways of a program that will provide a Newark traffic pattern consistent with those for LaGuardia and New York International airports. Total cost of these two runways will be $10 million. One runway, now 60% complete, will be ready next September. The other, now 25% complete, will be ready a year later. Foundation stabilization, with 510,000 ft of vertical sand drains similar to those for the nearby New Jersey Turnpike, is a significant part of the runway work. Runway pavement design is based on full-scale test-track experiments at the runway site.

• **Philadelphia airports**—Philadelphia spent $5.5 million at its North Philadelphia Airport and Philadelphia International Airport in 1951. The major item was work on a new terminal-building area at the international airport to cost $13 million, it is 45% along toward 1953 completion. One runway extension and a peripheral taxiway were completed in 1951.

• **Air Force fields**—During 1951 the Air Force received appropriations totaling more than $3 billion for airbase construction in and outside the United States. Continental bases numbered more than 130. About 15 overseas sites were included. Major amounts of money go to the following installations in the U. S.: Camp Beale, Calif; Camp Shoemaker, Calif.; Eglin Air Force Base, Fla.; Wichita (Kans.) Municipal Airport; Friendship International Airport (Baltimore, Md.); Keesler Air Force Base, Mississippi; Portsmouth (N. H.) Municipal Airport; Wright-Patterson Air Force Base, Ohio; Olmstead Air Force Base, Penna.; Lackland Air Force Base, Texas; Kelly Air Force Base, Texas.

• **Naval aviation fields**—Under way in 1951 were improvements at about 30 naval aviation installations in the United States. To cost $170 million, most of the work involves new runways and extensions of old ones, to be built to a length equivalent (for operation) to 8,000 ft at sea level. Principal work is at stations designated as "Master jet bases." These are at Brunswick, Me., Chincoteague, Va., Oceana, Va., Cherry Pt., N. C. (Marine Corps), Cecil Field, Fla., Whidbey Island, Wash., Moffett Field, Calif., El Toro, Calif. (Marine Corps), and Miramar, Calif. $20 million worth of work also was authorized at nine outlying sites. The 1952 military construction appropriation contained $800 million for naval public works, a substantial part of it to go to aviation facilities at about 50 sites in the United States.

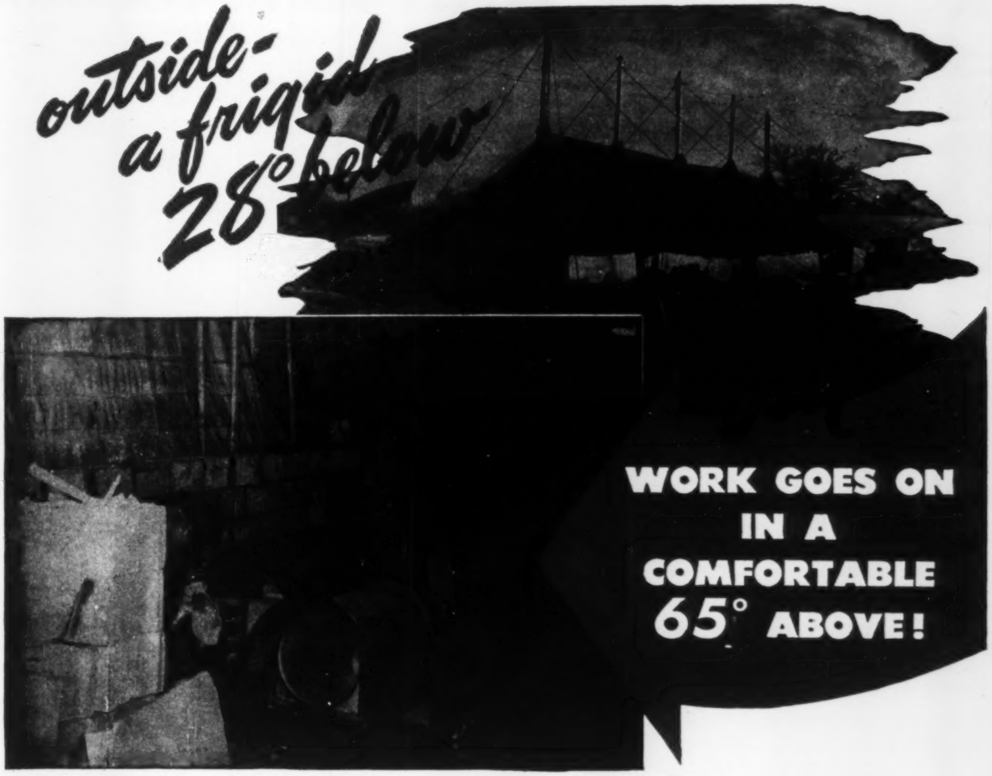
• **San Francisco airport**—Work started on a new $6.7 million terminal building that will accommodate 3,000,000 passengers yearly when completed in 1953. The six-story building will consolidate domestic and overseas service and is designed for later expansion if warranted.

• **Port of Boston**—Carrying out a plan first proposed in 1945 to bring port facilities up to modern standards, the Port of Boston Authority has completed the first of its five-unit plan, Hoosac Pier No. 1, and is virtually through with work on the second item, Mystic Pier No. 1. Other projects planned include a pier for East Boston, work on the Castle Island Terminal Wharf, and the proposed Northern Avenue development which will include an ultra-modern passenger terminal. Total expenditure by the authority when its five steps are completed will be about $35 million.

• **New York pier**—New Pier 57, Manhattan Island, to be supported partly by the buoyancy of submerged concrete chambers, processed during 1951 with dredging and old-pile removal at the site, and with chamber construction off-site. The three reinforced concrete chambers, maximum size 370-82 ft, by 34 ft deep, were 30% complete at year-end. Chamber construction is taking place in a pumped-out clay pit near the Hudson 40 miles from New York. When complete the chambers will be floated in the flooded pit, removed through a new channel to the river, and towed to the pier site. The pier also will feature a prestressed concrete deck system.

• **Long Beach, Calif., Harbor**—A $1.6 million transit shed on Long Beach Harbor's

(Continued on page 121)



Thanks to Silent Glow Portable Heaters, work on this housing project in St. Paul was completed on schedule last winter in spite of sub-zero temperatures.

This winter, the scene will be repeated on construction jobs from coast to coast where Silent Glow units will be effectively used to dry plaster, keep concrete from freezing, thaw frozen machinery, and to provide more comfortable working conditions.

Easy to use . . . just wheel unit where heat is needed . . . then flick the switch . . . in a matter of minutes, unit will deliver 168,000 BTU per hour. *Safe* . . . all moving parts and heated surfaces fully protected . . . fire goes out immediately when switch is snapped off or power is shut off. *Clean* . . . burns without soot or fumes . . . no carbon monoxide or unburned hydrocarbons. *Economical* . . . low original cost . . . operates on low cost No. 2 fuel oil.

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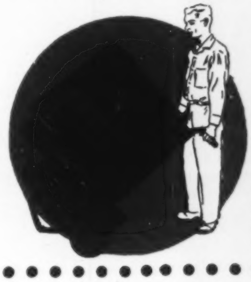

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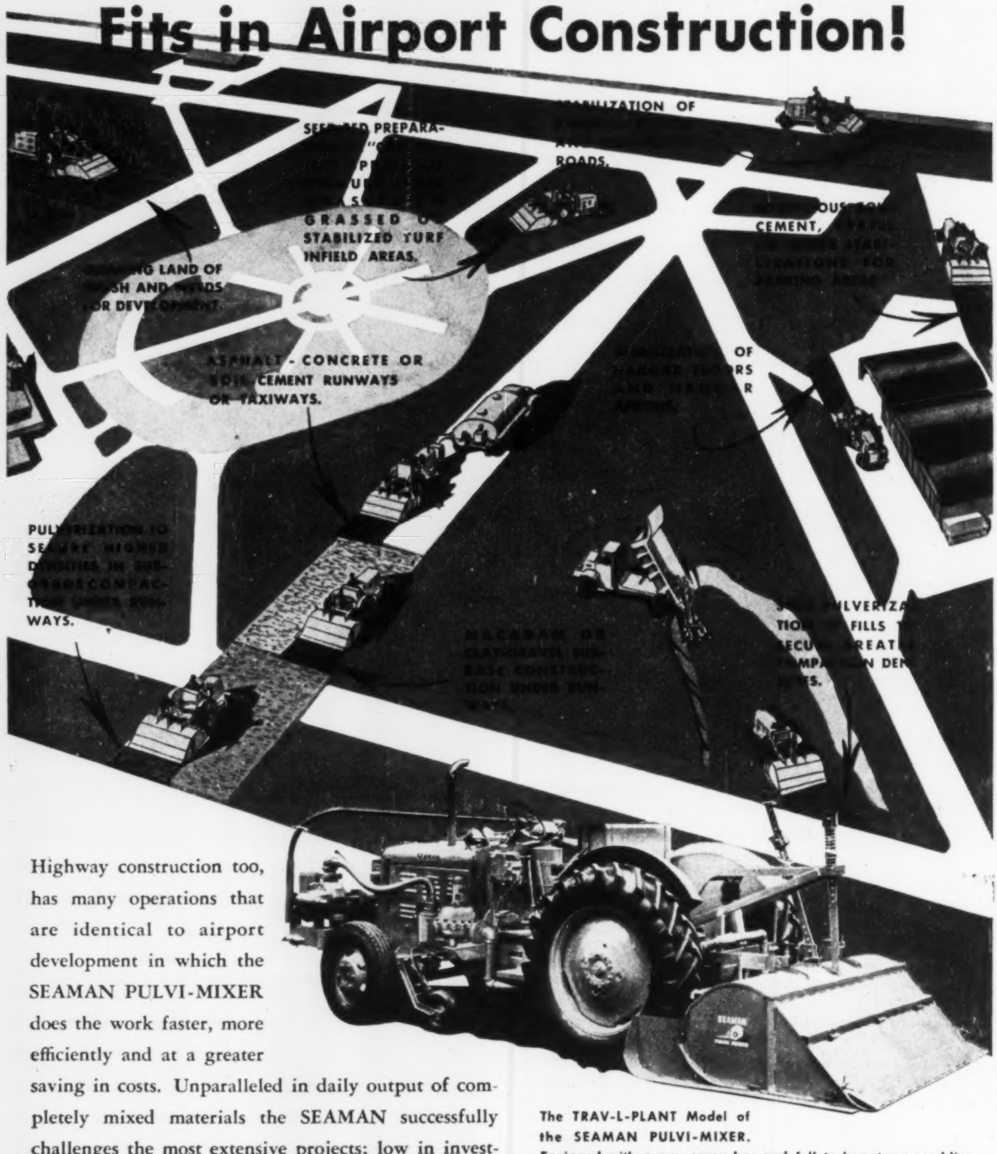
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Send for this FREE book on up-to-the-minute practices in mixing for all types of stabilized construction. Write for Bulletin 25.

(*Continued from page* 118)

Pier A will be finished this spring after materials shortages delays. The shed brings expenditures on this pier to more than $13 million. The $2 million six-lane bridge over the Los Angeles River flood control channel, on a major approach to the harbor area, is expected to be completed in the fall.

- **Los Angeles Harbor**—More than half of the $6.5 million for a new passenger-cargo marine terminal has been obligated or expended. This port of Los Angeles facility, publicized as the "largest and finest" in the world, is scheduled for completion by the end of 1952. It is being built for preferential assignment to the Matson Navigation Co.

- **Honolulu, T. H.**—Construction of a new $3 million overseas terminal at Pier 2 in Honolulu harbor was started by the Hawaii territorial government in 1951. Improvements include a 250x1,260-ft terminal shed of steel frame construction with walls of hollow tile and asbestos.

- **Super-Inch pipeline**—A $12 million addition to PG and E's $63 million, 34-in. gas line running from Topock, Ariz., to Milpitas, Calif., included construction of three compressor stations. The stations increased output by 150,000,000 cu ft daily, bringing each day's delivery to 400,000,000 cu ft.

- **Richfield Oil Co.**—Richfield Oil Co. in February, 1951, completed the last 54-mile section of its new pipeline linking Los Angeles with the San Joaquin and Cuyama oil fields. The $7 million project, begun in June of 1948, includes 112 miles of 14-in. pipeline and two pump stations. Richfield has started preliminary work on a $43 million refinery project to expand its Watson, Calif., facilities for making aviation gasoline.

- **New England pipelines**—Natural gas entered New England in 1951 for the first time. First delivery came to Northeastern Gas Transmission Co. at the Massachusetts line from a new 303-mi. Tennessee Gas Transmission Co. line across New York state. Northeastern also will get gas from a spur (to Connecticut line) of Transcontinental Gas Pipe Line Co.'s Texas-New York line. A second New England company, Algonquin Gas Transmission Co., soon will get gas at the Connecticut line, from a spur of the Texas Eastern line (the original Big-Inch).

- **Texas-Illinois pipeline**—Begun in August, 1950, the 1,417-mi. gas pipeline from the Texas Gulf Coast to Chicago was completed at the end of 1951. In Chicago, Peoples Gas Light and Coke Co., will distribute the gas. Public Service Co. of Northern Illinois will handle it in the suburbs.

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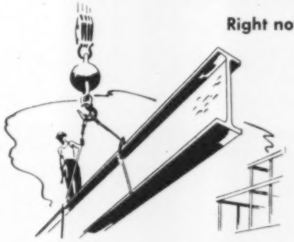

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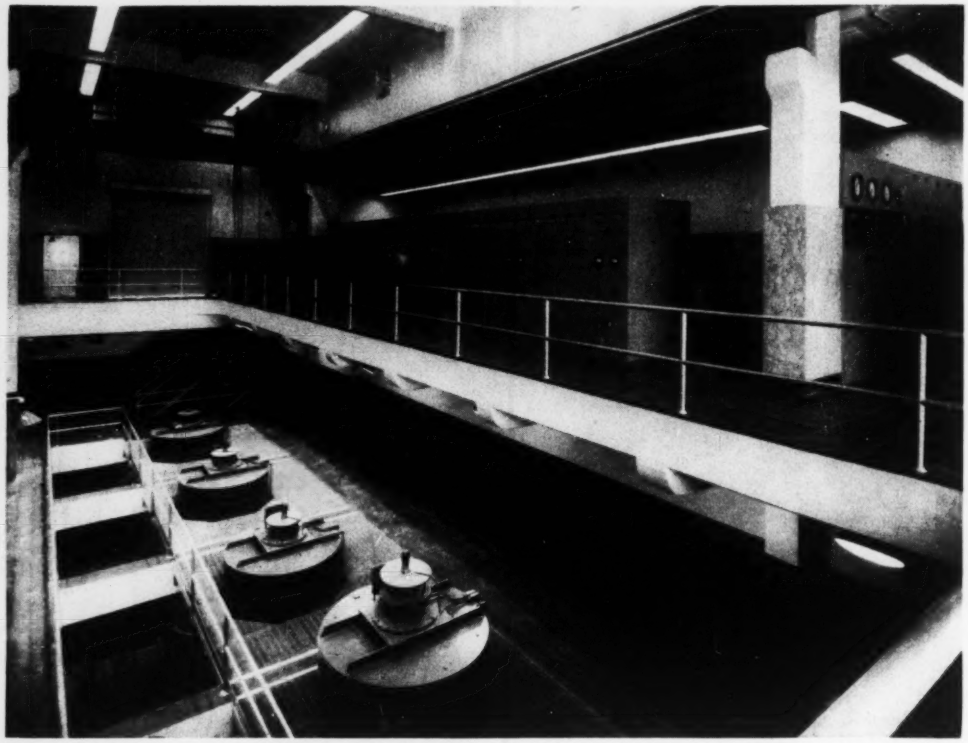


SEWAGE PUMPING FACILITIES in Oakland, Calif., will handle 100 mgd for the new treatment plant that serves Berkeley, Alameda, Albany, Emeryville, Oakland and Piedmont. Plant started operation late in 1951.

Techniques and trends . . .

Water Supply and Sanitation

MONEY SPENT IN 1951 on water and sewage works totaled $544 million—$42 million more than in 1950, the previous record year. This great increase was due entirely to a burst of sewage disposal construction; waterworks activity actually declined.

The totals—$209 million and $335 million—were respectively 3 percent under the previous year for waterworks and 16 percent above for sewage works.

Planned projects not yet let to contract increased in both categories as new proposals to build were advanced and many jobs failed to get started for lack of materials or money. The $1.4 billion waterworks backlog of a year ago is up 2 percent, and $2.2 billion worth of 1950 sewage works plans increased another 8 percent through 1951.

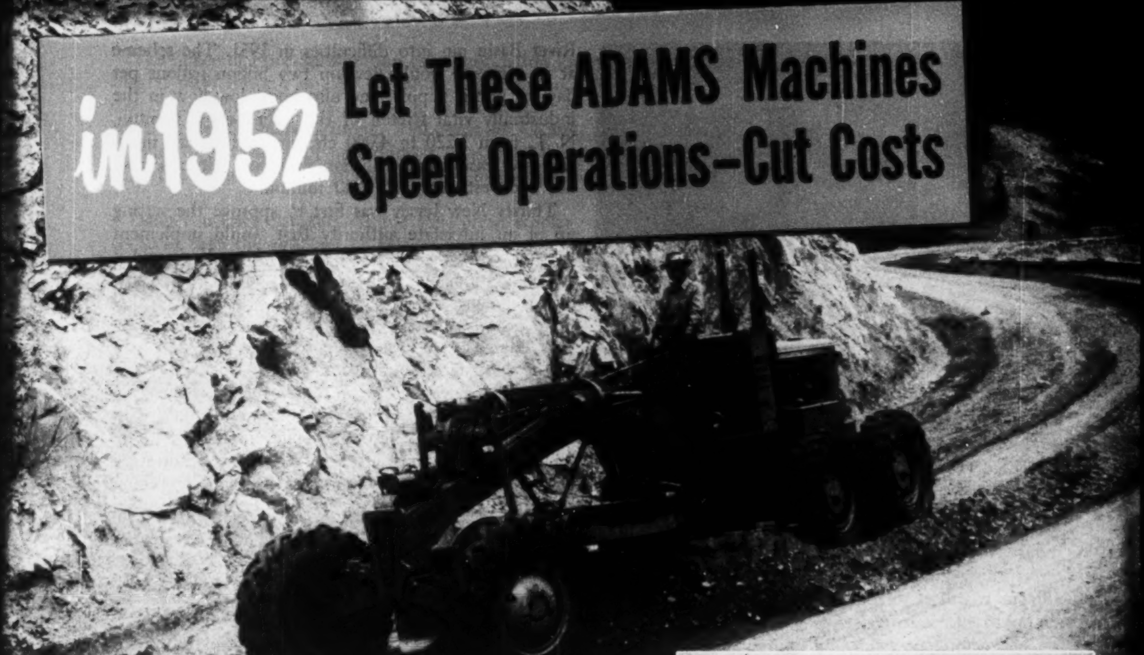
• **Water resources policy**—Sanitary engineers put their interests in a sound national water policy high on the 1951 agenda of discussion topics. And discussors were emphatic in their claim that public supply is the highest-priority use of water—a principle that was also emphasized in the statement of a sound water policy drawn up by the Engineers Joint Council panel.

The figure given for water use in public supplies is 15 billion gallons per day, or about one-tenth the total use including industrial and irrigation. Total use is in turn less than one-tenth average run-off, estimated at 8.5 inches per year. Of course, it's not always in the right place at the right time, but there seems to be an ample national water supply for public or other use.

One of these other uses—industrial—is of steadily growing importance. Industry takes from privately developed sources over five times the quantity public waterworks produce. Public supplies thus have been far outstripped in volume by private industrial use.

U. S. Steel's new Fairless Works on the Delaware River will demand 250 mgd—more than most U. S. cities consume. For Charleston, S. C., there is a plan now nearly designed for a new source of fresh water up to 10 billion gallons per day as a lure to attract

in 1952 Let These ADAMS Machines Speed Operations—Cut Costs



Here's a real time-saving, money-saving clue for '52 . . . For highest production—at lowest cost—you can't beat the world-famous, now better-than-ever, Adams line.

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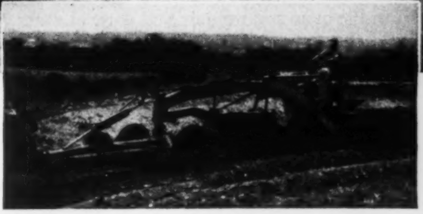

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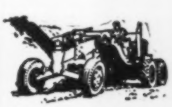
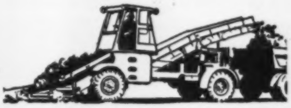
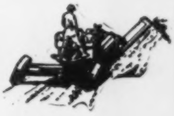


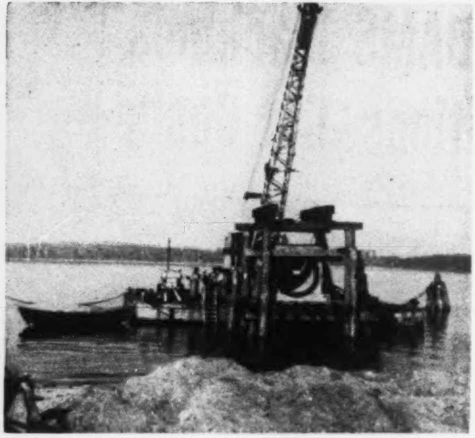
Motor Graders



TraveLoaders



Pull-Type Graders



WATER INTAKE for Portland, Me., is now in place in 20 ft of water in Sebago Lake. When this photo was taken it was about to be lowered from pile bent on which it was built.

industry. And on the West Coast the subject of replenishing ground water supplies with sewage-plant effluent is still a hot one as industries are forced into strenuous efforts to conserve.

Conservation of water is a salutary thing, especially in the more arid regions. And reuse of water is not only in the common interest, but it can be profitable. A California aircraft company reports it will save over $17,000 in annual water bills by special new pocesses designed for reuse of cooling water.

• **Supply dislocations**—Reports of localized water shortages continued through 1951, though perhaps less numerously than in '50 due to improved rainfall and completion of several new sources. The waterworks industry was catching up gradually with normal population growths and dislocations caused by World War II. But here and there a new defense installation or a decentralized industry was moving in on a community with terrific impact on its utilities.

Rainmaking got less space in the news than during the previous year, but activities in artificial precipitation continued with some meteorologists bullish, some bearish, on its effect. The meteorologist retained by New York City during its water-short days of 1950 advanced a claim that his activities brought a 17 percent increase in rainfall over the area seeded. This compares with a 12 to 14 percent claim made earlier by a western power company. Cost advantage of artificially inducing increased rainfall was put at 100 to 1 for New York City—compared to the price of supplying an equal increase in water by construction of new sources. A bill to control rainmaking activities at the federal level is still pending in Congress, with action this year unlikely.

• **State action stymied**—A most promising plan for integrated, four-state development of the Delaware River Basin ran into difficulties in 1951. The scheme at its ultimate would develop two billion gallons per day for public supply, and also boost low flow in the industrially vital stretch of the river below Trenton, N. J., from 1,220 to 4,000 cfs, combatting salt intrusion and easing the pollution problem. Ultimate cost has been estimated at $940 million.

Thirsty New Jersey was first to approve the setting up of an interstate authority that would implement the scheme. Delaware followed suit. New York said it would go along if Pennsylvania did; and Pennsylvania didn't. Future progress depends on what the Quaker State does in its next (1953) legislature. In the meantime, forces at work don't augur too well for the plan of the Interstate Commission on the Delaware River Basin. Pennsylvania has an independent engineering critique of the plan under way. New York State is at the point of asking Supreme Court approval of additional independent diversion of Delaware headwaters. And New York City is mulling over expert opinion that the time has come to forget further upland sources, to tap and treat the Hudson. There is a rocky road ahead for the Incodel Plan.

• **Money and materials**—Waterworks operators and builders struggled through another year with finances and procurement as chronic headaches. On the dollar side, there were continued reports of rate increases—mostly substantial and overdue—in the attempt to keep income abreast of growing operating expenses. On the materials side, builders of new water facilities saw their requests trimmed quarter after quarter—as did most everyone else. But there was solace—and advantage, too—in finally having in Washington an independent claimant agency for water and waste works constructors. This was the Water Resources Division of NPA, brought into being last year through heroic efforts of a committee from the profession. Further assurance came to operators with the NPA announcement that, shortage or not, there would be chlorine for water and sewage treatment. Machinery was set up for ordering.

• **Fluoridation comes of age**—With fluoridation of water supplies—a means of preventing tooth decay in children—it is now just a matter of time. The Kingston-Newburgh test has been declared a success by the N. Y. State Health Dept. after but half of its intended 10-year duration. The American Water Works Association has strengthened the language of its official resolution of approval. The National Research Council and, at long last, the American Medical Association have given the practice their blessing. The skeptics are losing in number, and the U.S. cities practicing fluoridation of water supplies now total near 130. Big cities are catching on. Milwaukee has been at it for some time. In 1952 it looks as if Washington, San Francisco, Cincinnati and Baltimore, among others, will join the list. Plans of the Providence Water Supply Board would bring half the state of Rhode Island fluorides with its water.

The Office of Price Stabilization gave fluoridation its biggest push forward in 1951 by raising the ceiling on sodium silicofluoride, thus making it worth producing for the chemical manufacturers. Still cheap at 7 cents a pound (14 lb will add 1 ppm fluoride to a 1-mgd flow of water) sodium silicofluoride should now be plentiful.

• **Danger in trace elements**—While widespread emphasis went into the problem of getting just the proper proportion of fluorides into tap water, a less heralded study was under way to determine just what are safe limits for the many other elements possibly found in water supplies. The Ohio River Valley Water Sanitation Commission is sponsoring this research project. Kettering Laboratory of the University of Cincinnati is doing the work. The project, still in its early stages, will attempt to establish a physiological basis for limits on trace amounts of cyanide, chlorides and phenols, for instance, that can be consumed safely by the human body without danger of cumulative and chronic toxicological effect. A long list of elements is under investigation. The research project is expected to answer questions hitherto unexplored, and broaden the base of knowledge on which engineers in public health must make decisions, designs.

Effort continues toward finding best ways of dealing with radioactive contaminants. Complete information on successes in an experimental 250-gpd water treatment plant at Oak Ridge were reported during last year. Along with word on precise results in removing radioactive iodine, phosphorus and mixed fission products came the warning that present knowledge must be applied with great care, and even the latest findings are subject to change as newer information develops. Progress is being made.

In Chicago—where some of the most advanced thinking about waterworks and atomic energy has been done—another, unrelated scientific application made the news in 1951, and showed the way for water suppliers (and others) to run a quick and relatively inexpensive geological survey. Depth of bedrock on the proposed distribution-tunnel line from the site of the $85,000,000 Central District Filtration Plant was fathomed by an electronic depth-finder. Detection of two hidden valleys is expected to aid tunnelers when that construction stage is reached at the now contested 65-acre site, off-shore in Lake Michigan.

Waterworks operators and state health agencies did a lot of talking about civil defense in '51. And some did more than talk. Water engineers were in about half the state CD organizations; there were mutual-aid plans among cities of most states; some, but little, action was being taken on antisabotage measures. Waterworks men in general were taking civil defense more seriously than most people. And in 1951, they had a good object lesson thrust at them when the Kaw River went wild, putting several Kansas cities in just about as authentic an emergency situation as a good bombing could. The way water systems were held together, then rapidly restored spoke well for those involved.

DAM BUILDERS put heavy riprap on the face of Neversink Dam, one of three 200-ft high earthfill structures New York City has underway for reservoirs to feed its Delaware Aqueduct.

• **Sewage disposal's big problem:**—Getting people to pay for sewage services was the crux of much that was said and done in '51, and there were several noteworthy variations on the theme.

In a nutshell: people are fed up with taxes. As a consequence, it has become increasingly important for those who finance, design and build sanitary facilities to do two things: Figure a fair system of charges against those who will benefit; educate those charged as to how vital the improvement is and how it will benefit them.

First of these "musts," the fair system of charges, now basks in limelight of a significant report issued last year, "Fundamental Considerations in Rates and Rate Structures for Water and Sewage Works." This 125-page document recognizes the fact that, with rare exceptions, rates and rate structures are unsound. And it states a fundamental consideration in setting fair charges: Money needed should be contributed by users and properties benefited in proportion to cost of the use and the benefits.

The trick is to apply this principle, assigning fair shares of total annual cost to the non-users and the various users. The report outlines a recommended procedure for applying the principle, and in illustrative example reaches this breakdown of charges for a sewage works: 45 percent against users, 55 percent against properties. User charges are further broken down against: quantity, 43 percent, suspended solids, 46 percent; chlorine demand, 11 percent.

The proof of the principle remains in its application, and there is evidence that some cities—notably Decatur, Ill.—intend testing variations of it.

Importance of setting fair charges for sewage service is of increasing importance as more and more wet industries tie into public sewerage for disposal of industrial wastes. Sixty-nine percent of our industries now do. It is obviously irrational to base charges against these industries wholly on either the value of their property or their load on the sewerage. There is a fair compromise, and it must be found if industries are to be sold on backing plans for needed facilities.

A continuing trend toward revenue bonds as the preferred method of financing sewage disposal is exemplified in Tampa, Fla., where a $13,000,000 issue will be redeemed wholly by a service charge (100% of the water bill, special charges for those who contribute more or less heavily than average to sewage flow or strength, plus a surcharge against new users for new lines).

• **Education eases things**—Public relations—education of the taxpayer—is probably the best tool available for prying loose dollars for sewage disposal construction. This fact is gaining recognition.

There was hardly a murmur of disapproval when the new sewer charge went into effect in New York City, where the local press annually parades out a review of progress—and the need for progress—in cleaning up bathing beaches. In the Raritan River Valley of New Jersey, where construction may soon start on a 27-mile trunk sewer project, a caricature called "Sad Shad" enlivens the local press and sewer authority literature with emotional appeal aimed directly at softening up those who will pay $30,000,000 for the much needed construction. A local-action campaign, complete with exhibits, movies, television and other aids, is under way in the Ohio River Valley to promote favorable bond issue votes for regional stream cleanup. And the U. S. Public Health Service intends getting into the educating job at the national level with a million copies of its 16-page comic book, "The Fight to Save America's Waters," an appeal to all ages.

The trend toward better public relations may evidence a realization among engineers that they talk too much to one another, don't tell the public enough about their capabilities and their needs. At least, it's a move in the right direction toward getting construction dollars for vital sanitation projects.

• **Enforcement ahead**—Education to the need for sanitary facilities will continue, of course, but 1952 may also be a year for more forceful activity. At the national level the problem of pollution abatement has been priced at $9- to $12-billion worth of needed construction. PHS is just winding up its 15 basin reports intended to define the problem.

Those guilty know who they are. In fact, they have known for some time. The PHS reports are largely a rehash of data already recorded by many of the states involved. But PHS likes to think of its basin reports as serving unofficial notice in a nice way on 11,800 cities and 10,400 industries said not to be properly treating liquid wastes. PHS has the power, with consent of the state involved, to take a firm or city into federal court; this has been avoided so far. This year the agency comes up to Congress for more money to carry out provisions of the Water Pollution Control Act of 1948. From its standpoint, the fact-finding stage is ended; enforcement is coming.

At the interstate and state levels, fact-finding continues by some agencies while others, more advanced in their activities, were issuing orders last year. It was not the best year in which to be issuing orders, what with difficulties in obtaining critical materials, plus the financing difficulties discussed above. Some cities with financing troubles blamed the materials situation. Those looking for an excuse not to build had one; others wanting to go ahead had difficulty. Both NPA and PHS recognized a necessary slowdown in waste works construction programs. Indiana noted 1951's progress and decided another 10 years—instead of six—would be needed to erase all pollution of its rivers.

• **Clear sailing for compacts**—If interstate pollution abatement agencies found the defense economy of 1951 a rough sea in which to sail their chartered courses, they enjoyed at least one comfort. The Supreme Court of the United States reversed a West Virginia court ruling, and said the state had not violated its constitution in joining and delegating certain powers to the Ohio River Valley Water Sanitation Commission. Questions of interpretation of an interstate compact go beyond unilateral jurisdiction of a state, said the court. At year end the 8-state Ohio basin agency reported there were municipal facilities under construction in its area to treat wastes from 8 percent of its population, final plans approved for another 20 percent. And the work of gathering evidence for prosecuting an effective program of cleanup goes on.

• **Progress but more problems**—Reports of other pollution abatement development came last year from North Carolina where a new law was passed, setting up an 8-man clean streams committee. Connecticut claimed it had cut water pollution 60 percent. Pennsylvania, where $150 million has been spent in the present clean streams drive, had finished desilting the Schuylkill River—only to find it heavily polluted by sewage. Ohio passed a new law (operative next September) with some healthy teeth in it for enforcement, then threatened 30 cities with court action under an old law unless they built treatment works. In 5 years of Oregon's pollution abatement campaign, 47 new or improved treatment plants were put under construction, and the sulphite problem of pulp and paper mills is being licked.

Reports of pollution problems were numerous, too. Chief among these was an International Joint Commission report that it will cost $127 million to clean up present pollution in international rivers between the Great Lakes. IJC will cooperate with federal, state and provincial agencies to see present conditions corrected. In another report made by Ohio authorities, 17 out of 25 Lake Erie bathing beaches were found beyond tolerated public health limits on coliform bacteria.

• **Industrial wastes**—The National Technical Task Committee on Industrial Wastes got together in Cincinnati last winter and "reported progress." And down in the

(*Continued on page* 129)

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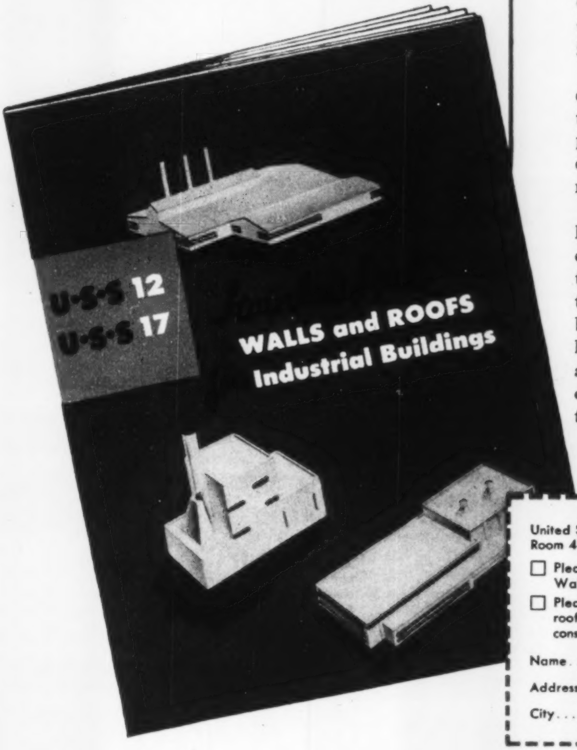

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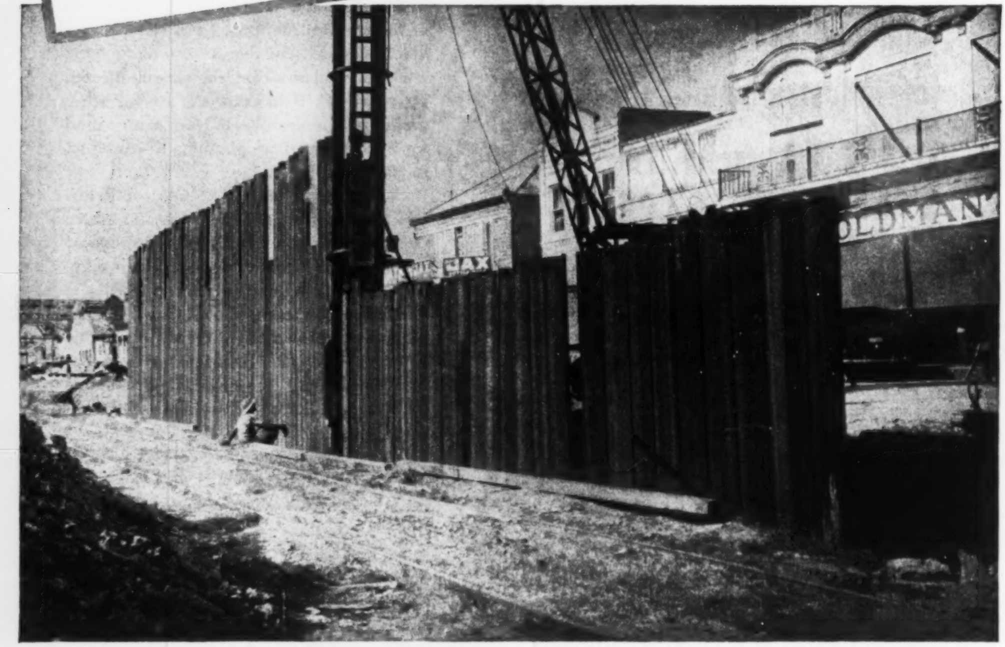
McKIERNAN-TERRY PILE HAMMERS aid flood control



A McKiernan-Terry No. 7 Double-Acting Hammer drives piling north of the highway bridge on the Berwick side of the river.

No longer will flood crests sweep through the streets of Morgan City and Berwick, La. on opposite banks of the Atchafalaya River, because new reinforced-concrete walls, set on piles, are well above previous flood heights. To drive both the steel sheet and timber piling on this vital job, McKiernan-Terry Pile Hammers were chosen by Hendry Corp., the contractor.

On the Morgan City floodwall, a McKiernan-Terry No. 9 Double-Acting Hammer was used to drive 20 ft steel sheet piling and 35 ft timber piling on a batter into clay and silt. Steam was furnished by a portable boiler pulled along on skids.

A McKiernan-Terry No. 7 Double-Acting Hammer punched down steel sheet piling up to 35 feet in length for the 5,278-ft Berwick floodwall. Compressed air powered the hammer.

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(*Continued from page* 126)

ranks of industry, in the everyday problems of good housekeeping and cooperative working out of problems, there actually was progress. Phenols were destroyed by three different chemicals in pilot plant operations cooperated in by three competitive concerns. And the first commercial phenol destruction setup was installed in New Jersey—declared expensive but necessary.

Chemical engineering knowledge of industry was meeting public health engineers at least half way in many solutions of industrial waste problems that may some day be solutions of domestic waste problems. Development work was progressing on a subsurface gas-burner for evaporation of waste liquids. In Wisconsin a novel heat exchanger was being tried on evaporation of sulphite liquor disposal. Wastes of the nuclear energy industry were undergoing chemical and biological treatment. It was recommended that relatively small discharges of radioactive wastes were best reduced in volume by evaporation, then buried.

• **Advances in the art**—A process successful in concentrating undigested sewage sludge to 20% solids was developed in Pittsburgh's Allegheny County Sanitary Authority. The controlled-heat, controlled-time sludge flotation process will be designed into a $12,500,000 treatment plant with facilities to burn the concentrated sludge directly, without digestion or filtering. Attendant economies are estimated at $4,000,000 on first cost of the plant, $100,000 per year on operation. Pilot plant evidence indicates the process will work on any raw sludge (not as well on activated). Its economics looks especially good in Pittsburgh where powdered coal is cheap with which to burn the sludge.

One year of operation on the Daytona Beach process substantiated that Florida city's faith in the high-rate chemical precipitation process that combines coagulation and settling in a single upflow tank. The 3-mgd plant averaged a 65.3% BOD removal.

• **Research: financing and findings**—At last year's industrial wastes conference at Purdue University it was suggested that pollutors be charged a fee for continued pollution of streams, the funds to be spent on research. But, meanwhile, the Public Health Service can't seem to find too many projects that merit its authorized grants and fellowships for basic research in sanitary engineering. Research under way holds promise for the future: ultrasonics have been found to promote sedimentation; vitamin B-12 has been successfully extracted from activated sludge—1.1 to 4.2 mg per pound of dry solids. This latter finding has already been applied at Milwaukee, Wis., where a patent has been applied for and commercial production is planned.

Some Major Water Supply and Sanitation Projects

• **Allentown, Pa.**—Construction of a filtration plant extension and high service pumping station is 60% completed and now estimated to cost a total near $3 million. All structures should be finished by mid-summer and the additions should go into operation by September. Final equipment contracts are being let now.

• **Baltimore, Md.**—The 17-mile, $23 million Patapsco water tunnel to bring in an additional 94 mgd was completely lined during last year and should soon go into use delivering 50 mgd from behind a temporary diversion dam. Meanwhile, work progresses on the permanent Liberty Dam under a $4.5 million contract let in August. Completion of the dam—and full use of the aqueduct—is not due until possibly 1955. Meanwhile, other future sources of supply are being studied.

This year work will begin on 13,500 ft of 48-in. precast concrete water main, and on a 24,000-lb-per-day master chlorinating station at Montebello Filtration Plant. A new $10 million filtration plant to treat 120 mgd in the northwest section of the city is under design. Fluoridation is expected to start this year.

• **Boston water**—During 1951 the Metropolitan District Commission finished its $1.7 million Blue Hill Reservoir to bolster supply of the Southern Metropolitan Water District. It also completed $4 million Chicopee Valley Aqueduct, 15-mile, 48-in. pipeline from Belchertown to the city of Chicopee. Carryover construction from 1951 includes another eight miles of 48-in. pipe (steel), plus some shaft and pumping work. Two river crossings are under way: A 1,200-ft Charles River crossing with 64-in. steel pipe, lined and encased is 35% completed. A 460-ft crossing of the Malden River is done but for some testing.

• **Boston sewage**—Nut Island Treatment Plant, to give primary treatment to 112 mgd, went into service Dec. 28 in Boston harbor. It cost $7.5 million. And the Metropolitan District Commission also finished $400,000 worth of work for the $7.5 million, 4-mile North Metropolitan Relief Tunnel—Chelsea to Deer Island. Alewife Brook Pumping Station in Somerville, Mass., is in its final stages of construction with six miles of 60 and 48-in. conduit also included in a cost over $2 million. In 1952 contracts will be let on four miles of 11-ft dia deep rock tunnel on the Chelsea-Deer Island line. Other contracts will cover portions of a $10 million Columbia Circle-Deer Island tunnel, a 5-mile, 12-ft bore in deep rock. A third tunnel on which work is to be let is a $4.5 million Charles River Relief Tunnel running 2.5 miles from Roxbury to Dorchester.

• **Cambridge, Mass.**—A major rebuilding and expansion project to cost near $900,000 is well on its way to completion. In its major phase, new flocculation chambers are being added and existing settling tanks have had new capacity built in by addition of shelves inside as new floor area. Also, a new high-lift pumping station is being added and a utility building will be constructed.

• **Cleveland, Ohio**—The year 1951 saw completion of Cleveland's Nottingham Filtration plant, drawing 100-mgd from Lake Erie. This is a $21 million installation. The city now has plans to build in stages an additional water source on the westside to cost an estimated $15 million and add another 50-mgd to the total water supply—now 400-mgd.

• **Chicago, Ill.**—Last year the Department of Public Works installed 80,000 ft of service and water mains from 3- to 48-in. dia.; 344 gate valves from 4- to 36-in.; and 536 Chicago fire hydrants; at a cost of $1 million. About $3 million will be spent on this work during 1952; covering

BALDWIN HILLS RESERVOIR (293-mg capacity) is the newest addition to the Los Angeles water system. It serves the southwestern section of the city, including part of the area between it and the Hollywood Hills shown in the photo.

100,000 ft of 3- to 48-in. water lines; 350 gate valves; and 550 fire hydrants. Bids for cofferdam construction for the proposed 950-mgd central district filtration plant to be built just north of Navy Pier were received last December. A $6.6-million contract for this work has been approved by the city council, but the contract has not yet been awarded by the city purchasing agent.

• **Chicago**—Contracts totaling $4.5 million were awarded last year by the Department of Public Works for the construction of 45,500 ft of sewers ranging in size from 15-in. pipe to 13x13-ft. All pipe over 30-in. is reinforced concrete; smaller sizes are vitrified clay. Projects completed last year totaled 43,800 ft of sewer from 18-in. to 16½x13-ft at a total cost of $4,900,000. This year the department plans on awarding $12.8 million worth of sewer construction, the largest single project being 9,800 ft of 12x9½-ft to 14x14-ft monolithic sewer in Kostner Ave. Current and proposed sewer construction is in open cut, except for short lengths of tunnel under railroad tracks.

Construction of the Chicago Sanitary District's intercepting sewer system is nearly completed; with only minor extensions needed for areas recently annexed to the district. Last year was a big construction year: Three contracts totaling $4.5-million were awarded for 29,150 ft of 4½x5-ft reinforced concrete sewer in tunnel, and 18,490 ft of 21- to 36-in. pipe. Two previous sewer contracts were completed for $2.9 million; with $1 million worth of other sewers still underway. Three contracts also were awarded for $615,000 of improvements at two sewage pumping stations. Last year the Sanitary District awarded $6.4 million of new contracts at its 800-mgd West-Southwest Sewage Treatment Works; completed $4.8 million; leaving $8.7 million still underway. Contracts for all work remaining for completion of the plan, including some electrical and mechanical work, insulation, piping, coal and sludge handling, and landscaping are expected to be awarded this year.

• **Dayton, Ohio**—Contracts totaling $4.1 million were awarded last year for the construction of a 96-mgd water softening plant; based on a filter rating of 3-gal per sq ft, per minute. The main building will be 400 ft long with a 120-ft wide head house, three stories high plus basement. There will be four large concrete settling basins each with a separate mixing basin; a 5.4-mg clear water reservoir; and a small chemical unloading building. The operating gallery will be 360x20 ft. Other major features include: 7 overhead chemical bins, of 90-ton capacity each; complete filter equipment; four mixing basins, four settling basins, and four recarbonation basins. Bids will be received early this year for a 16-mg underwater reservoir with booster station, and a heavy loop line between two elevated tanks.

• **Denver, Colo.**—The Board of Water Commissioners will let contracts this year for a 21-mg concrete reservoir for filtered water at Capitol Hill pumping station; a 60-mgd filter addition to the Moffat plant; and about $1 million worth of water mains in the city's distribution system. Excavation has started and diversion will soon be made on the 340-ft high gravity concrete dam No. 22. Total project cost is $11 million. The contract cost is $7 million with the city furnishing all materials except concrete aggregates. A 10.5-mg box-type reinforced concrete reservoir, costing $332,000, has been started in the eastern part of the city to maintain pressure in that area. Last year 16,370 ft of 30-in. wood conduit was replaced with 30-in. concrete pipe at a cost of $387,500. Construction of a 54-in., 44,900-ft long concrete conduit carrying raw water from Ralston reservoir to the Moffat filtration plant—awarded in 1950 for $1.7 million—is 85% finished.

• **Detroit water**—Three contracts totaling $4.5 million were awarded last year for first stage construction at the city's 200-mgd Northeast water treatment station, designed to augment the present supply of filtered water from the city's two existing plants. The work involves foundations and miscellaneous structures including 4,600 ft of cast-in-place, end-bearing concrete piles; low-lift plant substructure; three 60-mgd and three 50-mgd pumping units, including motors; and two 7.5-mgd dewatering units. Contracts completed last year include: A 5,430-ft section of the 26,600-ft, 10-ft ID Northeast tunnel, for $1,385,000; 5,330 ft of 54-in. and 5,300 ft of 60-in. steel cylinder reinforced concrete pressure pipe, for $557,000. The city's Department of Water Supply expects to let ten contracts this year for $12.5 million worth of construction at the Northeast station, and water mains. They include: Low-lift plant substructure and superstructure, $1,256,000; settling basins and chemical building piles, $2.8-million; filter building, $3.8 million; valves, gates, transformers and switchgear, $2.1 million; 28,000 ft of 54-in. and 5,100 ft of 36-in. water mains, for $2.5 million.

• **Detroit sewage**—Difficulties and delays encountered in securing approval for critical materials have prevented the starting of construction on the Southfield intercepting sewer, although the $4.8 million contract was awarded last March. Work is progressing satisfactorily, however, on two important contracts awarded last year. They are: A $965,000 caisson contract for the Freud Ave. pumping station, and the $177,000 East Warren relief sewer. Construction of the $3 million Freud Ave. sewer—awarded last December—will be started early this year, but no work has been started yet on a $212,000 contract for the Ormond relief sewer which was awarded last June. Construction proposed for this year includes: The Freud pumping station substructure, the plant's superstructure, the Conant-Mt. Elliot sewer, and the Essex Ave. relief sewer.

• **Dallas, Texas**—The city's 18-mgd sewage treatment plant is 33% finished, with completion scheduled for March, 1953. The $2.7 million plant will contain screen structure and raw pumping

(Continued on page 133)

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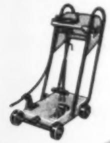

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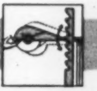

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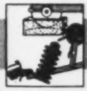

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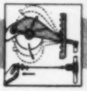

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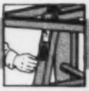

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(*Continued from page* 130)

station, primary and secondary settling tanks, eight trickling filters and two digesters.

• Hetch Hetchy Aqueduct—A 34-mile pipeline around the south end of San Francisco Bay will be completed early in 1952 at a cost of $9 million. This will bring to 180 mgd the capacity of the aqueduct system to supply San Francisco and peninsula cities.

San Francisco's Water Department is also working on the $2 million Sunset supply line that calls for 19,000 ft of 60-in. dia steel pipe to bring additional water from terminal reservoirs of the Hetch Hetchy aqueduct into the city.

• Honolulu, T. H.—Since January, 1948, the City and County of Honolulu has placed under construction 57 of a list of 87 sewer projects in a 10-year, $22 million program. Of these, 41—worth $5.8 million—are completed and 16 worth $3.3 million are in progress. Scheduled for 1952 are 15 more estimated at $4.4 million. During 1951, ten projects were completed at a cost of about $2.9 million, adding to the city's system about 25 miles of sewers and two new sewage pumping stations.

• Lake City, Wash.—Work costing about $1 million was carried out during the year in the Lake City Sewer District just north of Seattle, Wash., with contracts awarded for work costing $4 million to be carried out in 1952-53. The 1951 work included trunks and laterals while the new work consists of a treatment plant, tunnel, lift station and laterals. Bids will be called during the year for laterals estimated to cost $750,000.

• Los Angeles water—The Los Angeles Department of Water and Power completed the $10 million Baldwin Hills reservoir in April, 1951, after four years' work. The 293-mg reservoir increases close-in storage and gives better pressure regulation in south and southwest parts of the city.

• Los Angeles sewage—All units of the new 245-mgd, high-rate activated sludge plant at Hyperion were in operation early in 1951 except for the elutriation and sludge concentration system. During 1951, $7.2 million worth of contracts were completed, including the aeration and final settling system and the influent connection. All the remaining work is substantially completed with contractors engaged in testing and adjusting equipment and correcting minor deviations from specifications. As of November 30, 1951, the work under construction showed the following completion percentages (figures in parentheses are contract amounts): elutriation and sludge concentration, 85.3% ($1.4 million); filter, drier and sludge storage, 99.9% ($6.3 million); power and blower plant, 99.9% ($3.6 million); power and light distribution, 99.3% ($1.2 million); warehouse and shops, 97% ($414,000); administration and laboratory, 98.5% ($473,000); and plant grounds improvement 85.3% ($696,000).

• Mobile, Ala.—The 100-mgd Big Creek water supply project is now over 90% completed. Closure of the diversion structure of the dam was made in December and the reservoir is now filled. Nine miles of 60-in. pipe and seven miles of 48-in. are finished and pumping station installations are near completion.

• New York sewage—During 1951 the city's Department of Public Works had under construction $49 million worth of sewage treatment facilities in a program aimed at complete cleanup of all bathing beaches by 1953.

At year's end the Owl's Head plant—an $18 million, 160-mgd high-rate activated sludge installation—was 95% completed and substantially ready for operation in Brooklyn. Hunts Point plant in the Bronx—$23 million activated sludge plant to treat 120-mgd—was 90% finished. Also 90% finished was Rockaway Beach plant, a $5.7 million installation of the high rate activated sludge process in Queens. Just begun in 1951 and 30% completed at year's end was the Port Richmond plant, Staten Island, a $2.4 million primary treatment plant.

The 1952 capital budget, based on income of $37 million from sewage service charges, includes two major projects. The 40-mgd Bowery Bay activated sludge plant will be extended to 120-mgd, and a 15-mgd high rate activated sludge plant will be built at Oakwood Beach, Staten Island.

Some $4.6 million worth of incinerator capacity was under construction during 1951 for destruction of refuse and garbage. Major item was the 1,000-ton Gansevoort destructor. For 1952 $8 million have been provided for a 1,000-ton destructor on Long Island's South Shore in Brooklyn and for a Marine loading plant on Flushing Bay, Queens.

• New York water—The Board of Water Supply pushed construction on its three upstate reservoirs throughout 1951 and has plans for letting another $10 million worth of work in '52. At year end this progress was reported: $25.5 million Merriman Dam on Rondout Creek in the Hudson watershed was 85% complete. It's a 195-ft high earthfill 2,400 ft long to store water with a 100-mgd daily yield. A 5-mile, 10-ft dia tunnel from Rondout reservoir to Neversink Dam in the Delaware watershed is 50% finished, to cost $15.7 million. Neversink Dam, from which 105 mgd will flow, is 80% done and will cost $32 million; it is 195 ft high and 2,820 ft long, an earthfill. From Rondout to Pepacton reservoir on the Delaware's East Branch, $44.3 million East Delaware Tunnel is being constructed to deliver 335 mgd. The 11-ft 4-in. bore, 26 miles long is now about 38% complete. For Pepacton, Downsville Dam, a $35 million earthfill 204 ft high and 2,450 ft long is 65% finished. Much reservoir work, about $15 million worth, remains to be done here.

With the 85-mile Delaware Aqueduct now virtually completed but for some minor operating equipment installation, the total cost of this longest tunnel in the world is estimated at $164 million.

• Nassau County, N. Y.—The $25 million activated sludge treatment plant at Bay Park on Long Island's south shore was completed and put into operation in 1951. It will eventually treat 53 mgd, which is over half the sewage load of the county. Interceptor work contributory to the plant continues.

• Nogales (U. S.—Mexico)—An international sewage treatment plant, completed last September in Nogales, Ariz. by the International Boundary and Water Commission, will serve both that city and Nogales, Sonora, Mexico. Costing $463,100, including $138,000 for outfall lines, the 1.6-mgd plant is designed to serve 20,000 persons in the two cities. Each country constructed the works within its own boundaries but the total cost was split equally between the two countries.

• Norfolk, Va. sewage—A sewage siphon in operation since 1888 and believed to have been the oldest in this country was replaced last year by a pipe of larger diameter. The city also put in a $158,000 sewage pumping station and force main.

• Norfolk, Va. water—Last year saw completion of a 12-mgd addition to the purification plant at Moores Bridges. Work was begun on 16 miles of 48-in. concrete pressure pipe from impounding reservoirs west of Suffolk, Va., at a cost of $2.4 million. An $866,000 pumping station was also started.

• Oakland, Calif.—The $23.5 million interceptor and sewage treatment plant program undertaken by the East Bay Municipal Utility District was practically completed in 1951—going into operation Nov. 15. The three major interceptors that cost $11 million are nearly finished. Completed is the outfall sewer extending 4,000 ft on land and 2,000 ft under the water of San Francisco Bay. At the $12.5 million treatment plant, the raw sewage pumping station and grit chambers are completed, as are the effluent pumping station and sedimentation basins, leaving only a small amount of work to be done on the sludge digestion tanks. Cities served are Oakland, Alameda, Albany, Berkeley, Emeryville, and Piedmont.

(*Continued on page* 134)

HOW TO HANDLE WET JOBS

#2 of a series

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• Philadelphia, Pa.—The Northeast Sewage Treatment Works was placed in partial operation early last year, and the plant was dedicated finally in December. It is a 125-mgd activated sludge plant. At Southwest Works sedimentation tanks are complete and work on sludge digestion tanks and equipment is 40% complete. The $6 million Southwest intercepting sewer is 50% complete, and another $4 million worth of main and branch sewers were constructed in various parts of the city last year.

In 1952 the city hopes to see $5.5 million worth of work done at treatment works, $3.5 million work on interceptors and an equal amount in general sewer work.

• Portland, Ore.—Portland's $17 million sewerage system is 70% completed. During 1951 its treatment plant was put in operation. Contracts awarded during the year, including three pumping stations and equipment, totaled $3.5 million, bringing the amount spent on the project to date to $13.3 million.

• Salem, Ore.—Delays in obtaining materials have slowed work on Salem's $2 million sewage treatment plant that will handle domestic sewage as well as waste from twelve fruit and vegetable packing plants, meat packing plants and several other industrial establishments in Oregon's capital city.

• Portland, Me.—The Portland Water District completed a waterworks system for the town of Standish in December—its intake in Sebago Lake. But a bigger Sebago Lake job is the 70% completed million dollar intake for Portland. This 60-in. inlet 800 ft offshore connects with a screen chamber, then the concrete transmission line cuts through a rock divide into the city. The intake itself is finished, a brick structure is to be built over the screen structure, and the delivery line is incomplete, waiting for spring. Included along the line is a building where vacuum pumps will be installed to make the conduit (66-in. pipe for 480 ft of its length) act as a siphon.

• Providence, R. I.—The Blackstone Valley Sewer District has its three-step, $16 million trunk sewer and treatment project about one third finished. Some $6.1 million worth of contracts let so far were 85% completed at year end. Largest single contract, $2.8 million for Bucklin Point Treatment Plant was about 72% complete and work was finished on some $1.7 million worth of interceptor construction. Two other contracts for major lengths of interceptor, totaling about $1 million in cost, are now about 70% complete dollarwise. Step Two will be a doubling of present 23-mgd primary capacity; Step Three eventually will add secondary treatment yet to be designed for the combined domestic and industrial wastes flowing to the plant.

• San Francisco—Two new sewage treatment plants totaling 95-mgd capacity were completed and operation started in 1951. Contracts involved exceeded $16 million. Still under way is construction of additional intercepting and collection sewers. Contracts totaling $1.1 million were in progress at the end of 1951. Work totaling $3.4 million is scheduled for award in 1952. When all this is done, practically all of San Francisco's domestic sewage will be treated.

• Spokane, Wash.—Spokane's $3.5 million move to clean up her scenic "front yard" river finds biggest phase of the job—the intercepting sewer line—about 50% complete at year end. Over-all estimate on the job is $2.7 million for the sewer, with about $800,000 more for the disposal plant. Intercepting system will total 13 miles in length, including two tunnels, one 6,200 ft long now under construction and one 5,700 ft long to be bid early in 1952. Contracts to date have totaled $1.6 million.

• Tampa, Fla.—With the $12 million sanitary sewer project about 92% completed, the pumping stations and sewage treatment plants were placed in operation in December. The entire project includes the 36-mgd treatment plant, three sewer river crossings, three harbor channel crossings, 3.9 miles of forced main, and 27 miles of intercepting and trunk sewers. It is a complete, comprehensive system financed entirely by revenue bonds.

• Washington, D. C. sewage—Construction of four sludge digestion and four sedimentation tanks at the D. C. sewage treatment plant was delayed during 1951, but is hoped to be completed this spring. The District let a $734,000 equipment contract in 1951 for sludge drying and incinerating facilities at the plant and expects to advertise early this year for bids on a $1.2 million building to house this equipment.

• Washington, D. C. water—The Washington District of the Corps of Engineers, which supplies water to D. C. through the Washington Aqueduct, has work about 20% complete on a 30-mg clear well (at Dalecarlia filter plant) awarded in October 1950. With connecting conduits, this construction will cost nearly $3 million. Design work was pushed by consultants in 1951 for a 450-mgd filtered water pumping plant to cost about $5 million.

Design is about to begin on a raw water supply to cost about $6.5 million involving 1,800-ft dam across the Potomac at Little Falls, a 427-mgd pumping station and tunnel one mile long. The District has $2.3 million now to start construction.

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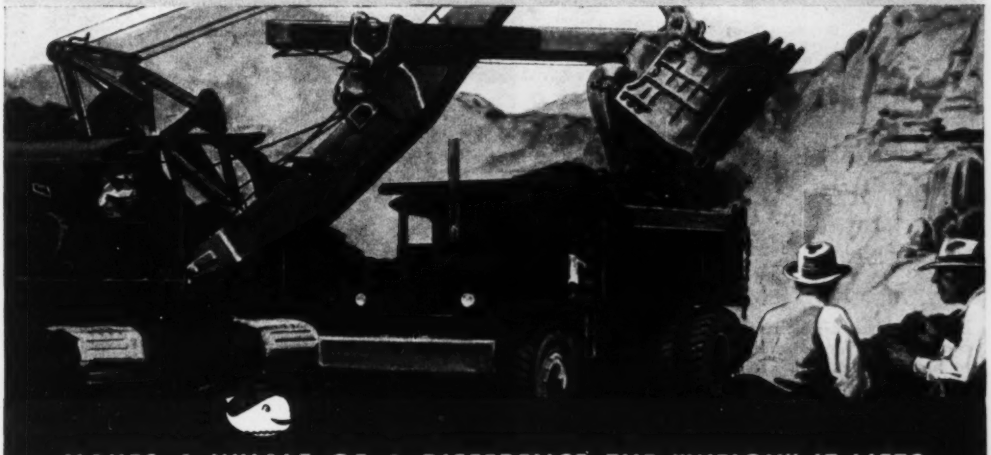

MAKES A WHALE OF A DIFFERENCE THE "WEIGH" IT LIFTS

Pictures from Industry

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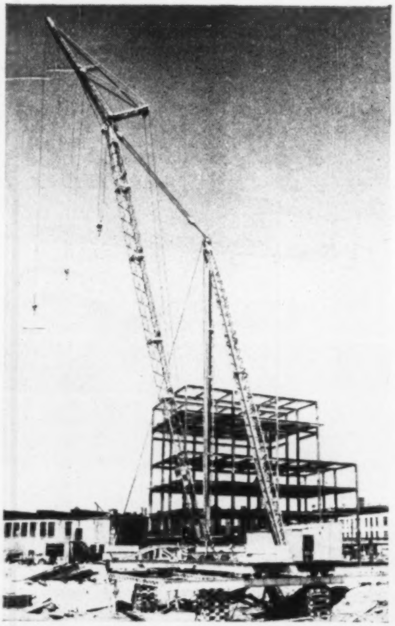
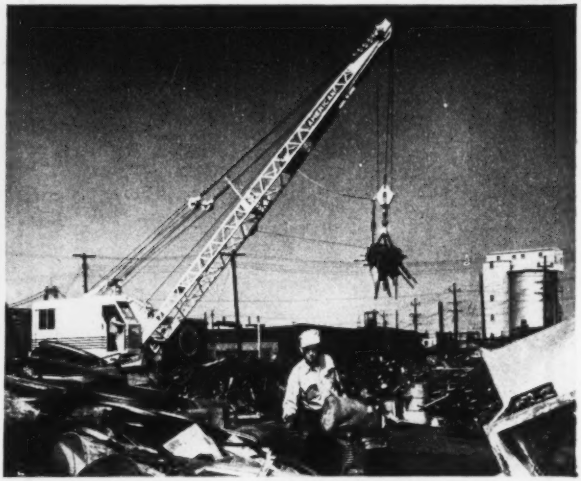
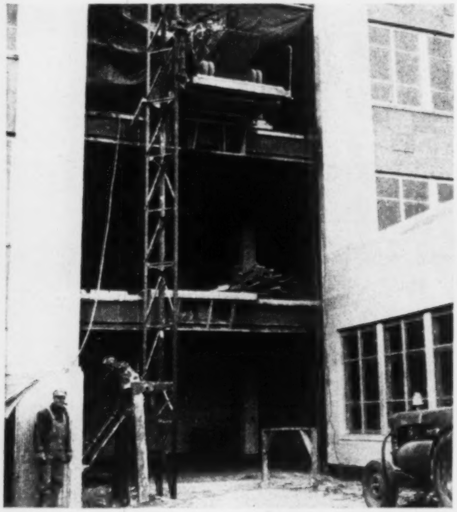
CROSBY CLIPPER



Eight-story boom on wheels. Onlookers' eyes really pop when this towering derrick *rolls*, as it lifts, as it swings. Built for Beasley Construction Co. by American Hoist, it has a 150′ boom, 35′ jib, and travels on 180 feet of track, setting steel to height of eight stories.

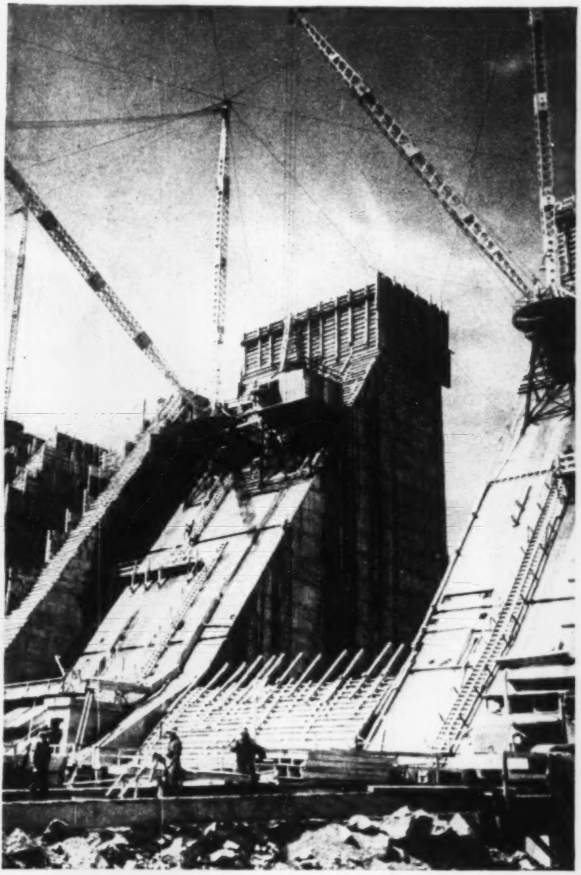
Du Pont picks up the pieces. Pushing its scrap drive at full steam, Du Pont has this tireless American Locomotive Crane working every minute. Interesting scrap items include old fire engines, office machines, whole buildings.



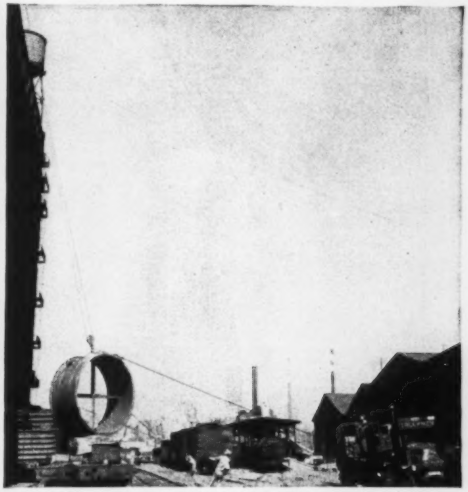


Beating the clock in Wyoming. Racing to complete the new Wyoming State Office Building in time for the 1951 Frontier Day Celebration, contractors Riedesel-Lowe Co. chose an American Portable Material Elevator. Teamed with power buggies, the PME lifted 3,500 yards of concrete at speed that an old-fashioned wooden tower couldn't approach.

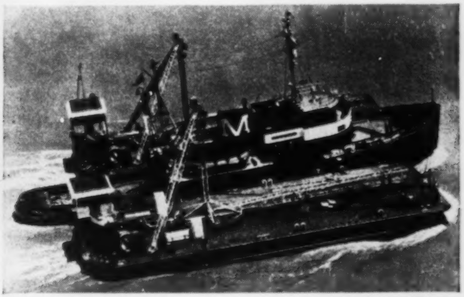
The AMERICAN HOIST line includes: Hoists • Derricks • Locomotive Cranes • Crawler Cranes • Revolver Cranes • Portable Material Elevators



A forest of derricks. Imagine thirteen more guy and stiffleg derricks added to the four above, and you'll visualize how they built the great Trenche project, up in Quebec. Seventeen of these long-armed steel monsters helped bring the job to completion seven months ahead of schedule. Located on the St. Maurice River, this dam and power plant will produce 325,000 horsepower for Shawinigan Water and Power Co. All seventeen derricks used on the job were powered by Model 100 American Hoists—members of the largest and fastest-selling line of hoists in all the world.



Lifting on the fly. It was a busy spot . . . and a narrow space . . . but 55,900 lbs. of equipment had to be hoisted nine stories up. So Frank M. Herbert, Brooklyn trucker, used an American hoist mounted on a truck bed. They moved in, finished the job, moved out at top speed . . . safe all the way, with the smooth, rugged American hoist.



Next stop, Venezuela. Lashed to a Moran Towing tug, this pair of derrick barges was moved from New Orleans to Lake Maracaibo oil fields. Designed for punishing barge duty, these American derricks have maximum strength, minimum weight, absolute dependability.

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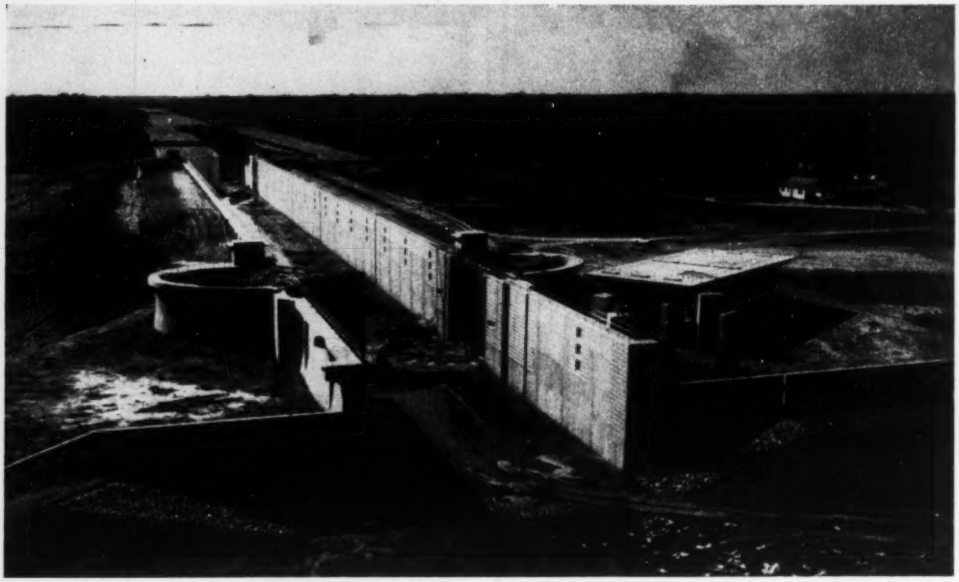

ALGIERS LOCK and its 9-mi canal, to be completed by June 1954 for $14,000,000, will speed east-west barge traffic on the Gulf Intracoastal Waterway past New Orleans.

Techniques and trends . . .

River Use and Control

AS THE YEAR 1951 OPENED, hope was high that a national water-resources policy would be taking shape before the year closed. The hope was vain. And there is little expectation that it will be raised again in 1952—more politically pressing problems are on the docket.

But what happened is significant. When the findings of the President's Water Resources Policy Commission were made public late in 1950, it was understood that they would be followed by recommendations to the President for necessary legislation. And since the thinking of the Water Policy Panel that had been set up by the Engineers Joint Council was not too far from that of the President's commission, it appeared probable that the commission's recommendations would not be harshly treated when they reached Congress. Hence definite progress toward developing a national water policy appeared probable.

But the year slipped away without any legislation relating to national water policy appearing in Congress. Why, is anyone's guess.

One conclusion is that the commission's recommendations were not in harmony with the President's own ideas. He is known to favor the creation of valley authorities to take over river development work. His commission proposed only that river basin commissions be set up to coordinate work of existing agencies.

Since the new year opened, the President has told Congress that he expects soon to send to it legislation relating to better planning for use of the Nation's water resources. Not much can be expected from Congress however in a year when political expediency dictates delay in coping with controversial issues.

• Floods in the Kaw River valley—Yet the rivers themselves wouldn't wait. As if to keep public attention centered on the need for better planning for the control and use of the waters of the Missouri basin, the Kaw (Kansas) River, biggest tributary in the system, poured out the most costly flood in the country's history.

Authorized plans of the Army Engineers for the Kaw River valley were based on the highest flood of record, that of 1903, which attained a peak flow of 260,000 cfs at Kansas City. The 1951 flood crested there at 510,000 cfs. Its total damage now is put at $725 million, or nearly twice the cost of dams and levees then planned or under construction to control floods in that river. Only two of the planned storage reservoirs were in service when the 1951 flood came.

New work planned since the 1951 flood—to handle a flood of that magnitude—will bring the total cost of reasonable protection to nearly $700 million.

• River work at a high level—Elsewhere across the country the construction of dams for river regulation and power continued at record levels, being

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FLOOD CHANNEL PAVING in southern California completed in 1951 included this critical 2-mile section of the Los Angeles River and the adjoining 1-mile stretch of the Rio Hondo. Corps of Engineers was the construction agency.

centered chiefly in large projects that had been authorized before the nation's current defense program got under way. Some new projects having power possibilities were authorized last year, especially in the Northwest where new capacity being brought into production is not keeping up with demand resulting from an influx of electro-chemical industries. (More on the nation's battle for additional kilowatts is given in the article on p. 68.)

The power situation in the Northwest also appears to have been a factor in the decision of the Federal Power Commission to grant licenses to the Tacoma City Light Department for two projects on the Cowlitz River and to the Portland General Electric Co. for a development on the Deschutes River. Both these licenses were fought bitterly by the fishing interests. The Federal Power Commission appears to have concluded that the fears of the fishing interests were unfounded, that the means of getting fish past the dams, which the utilities propose to build, will be adequate.

Also a result of the tight power situation in the Northwest is the continuing discussion of the need for some steam stations in an area that not many years ago was considered to have unlimited water power.

Similarly, in California, major emphasis in plans of the big private utilities now is on steam stations. The Bureau of Reclamation also would like to build a steam station to round out its system in the Central Valley, but that plan was blocked in Congress.

Part of California's growing need for power could be met by building the Bridge Canyon project on the Colorado River, and local public and private utility companies could finance the power end of that project. But Bridge Canyon Dam now is a key element in the planning of the Bureau of Reclamation for the controversial Central Arizona power and irrigation project, hence no one in California is counting on Bridge Canyon.

The Central Arizona project won Senate approval again this year but was killed by the House Public Works Committee. Its chances appear slim so long as no solution is found for the controversy between Arizona and California over Colorado River water for irrigation purposes.

- **First water goes to Columbia Basin project**—Outstanding from all other irrigation developments during the past year is the start of the flow of water from the Columbia River into the vast Columbia Basin where, ultimately, one million acres of arid land are to be brought under cultivation. Water now is being pumped up into the reservoir that has been formed in the Grand Coulee, the great dry valley of the prehistoric Columbia River. By May it is expected that the canals will be ready for delivery of water to the first unit of 82,000 acres that will be opened for settlement.

- **More water for Central Valley**—Also important, though somewhat less spectacular, is substantial completion of the initial development designed to supply more water to the intensively developed agricultural region known as the Central Valley in California. Planning for the project now nearing completion was started years ago by state agencies, but actual construction was taken over by the Bureau of Reclamation with federal funds during the depression years of the Thirties. One of the controversial issues that arose as a result centered around an attempt by the

WOLF CREEK RESERVOIR on the Cumberland River in Kentucky was essentially completed in 1951 at a total cost of $83,700,000. It will store over 6,000,000 acre-ft and pack 270,000 kw of power.

bureau to require that the limit of 160 acres per individual owner, which is specified by law on new irrigation projects financed by the federal government, be applied to the large landholdings in the Central Valley that are to get supplementary water from the reservoirs and canals built as part of the current work. California opposed application of that limitation and the fight still is going on. Latest development is a superior court decision that throws some doubt on the legality of the 160-acre limit.

During the past year, California issued a preliminary report on studies it is making looking to the day when even more water will be needed in the Central Valley. As the Bureau of Reclamation is understood to be making a similar study, there are indications of a further controversy centering around the question of whether that work will be done by the bureau or a state agency. If some of the proposed reservoirs could serve also for flood control, the question as to which federal agency should do the work—the Bureau of Reclamation or the Corps of Engineers—also would arise as it did during the current work. This points again to the need for a clearly defined federal water policy.

• **Steam power in the Tennessee Valley**—The Far West is not the only region with unusually large resources of water power that is turning its attention to steam. At the present moment the Tennessee Valley Authority has under construction five steam stations with a total capacity of 2,790,000 kw. By 1954 the capacity of TVA steam stations will be about equal to the capacity of its hydro stations. That is a most remarkable development in view of the bitter fight that was made in Congress over letting the TVA build steam stations to round out its power generating system when it asked for money for the Johnsonville station—the first of this group.

This transformation has come about as a result of the defense program. Vast amounts of new power were needed for the atomic energy plants in or near the TVA and for expanding defense production. The need could not be met with water power.

• **Water power goes to waste**—Meanwhile, enough falling water to operate an additional 1,300,000 kw of generators on the American side at Niagara Falls is going to waste, presumably because the President's close advisers, who are advocates of federal development of all new water power, are unwilling to let New York State or the private utilities develop the power at Niagara that can be produced with water assigned to the United States under the 1950 treaty with Canada.

In contrast, across the river in Canada, the Hydro-Electric Power Commission of Ontario is busily engaged in building a new plant to develop power from the additional water it obtained under the same treaty.

More power is going to waste in the international section of the St. Lawrence River due to the continued failure of President Truman's repeated attempts to get Congress to approve the long out-dated international agreement covering that work which was approved by representatives of Canada and the U. S. in 1941.

MANSFIELD HOLLOW DAM snakes along the Connecticut countryside to protect Willimantic and Norwich from flood waters of the Natchaug, Mount Hope and Fenton rivers.

• **Better protection from floods**—Although the flood control work that is accomplished in any one year does not appear impressive, the aggregate of the work done in the past few years will have an important effect in controlling the destruction from future floods in some regions. The lower Mississippi River valley is an outstanding example.

Not many years ago there was hardly a spring that did not bring with it the threat of flood or a real flood to some part of the alluvial valley of the Mississippi, where the river runs between levees for most of its length and where the crest of any flood is above much of the land on both sides of the river. But in recent years even near-record floods have done little damage, due to better levees, cut-offs, storage reservoirs and floodways.

The Bonnet Carre floodway on the east side of the river above New Orleans has provided that city with a large amount of protection for several years. Now, in an emergency, the half-completed Morganza floodway on the west side could be used to give added protection. That channel is part of the Atchafalaya River floodway system, also under construction, which will provide complete protection against uncontrolled floods for the whole valley below the Red River.

To a lesser extent, the big reservoirs now being built on the Missouri River will reduce flood dangers in the lower part of that river's valley and in the middle section of the Mississippi River valley. Even on the Ohio, where flood waters on the rampage again this month, storage reservoirs and flood walls are beginning to reduce the extent of the damage.

• **Not this year**—This year is hardly the time to look for more than a continuation of river control projects that were started before the fighting began in Korea. Only in the Kaw River valley can authorization of new projects be expected, unless the project will also provide power in an area where power is in short supply. Less compelling needs must await the Presidential elections and a new Congress. In the meantime, the backlog of pressing questions and needed projects can only continue to swell to huge proportions, making river control and development a major field of activity for years to come.

Some Major River Development Projects

• **California**—Pacific Gas and Electric Co. spent $5.1 million on hydroelectric projects during 1951, with the bulk of the work done at the **Bear River** development on the **Mokelumne River.**

The first unit of Southern California Edison's **Big Creek No. 4** powerhouse, on the San Joaquin River, was placed in service in June, the second unit in July. The 84,000-kw project, which cost $20.7 million has increased the total operating capacity of the Big Creek system to 523,000 kw.

Construction is proceeding on the $14 million **Cherry Creek Dam,** a joint project of the city of San Francisco, the Modesto and Turlock irrigation districts, and the Corps of Engineers. It will provide municipal water supply, irrigation supply, flood control and power. To date the 25-mile access road to the dam is 70% complete, and the contract has been awarded on the diversion tunnel. In the spring, bids will be called on the 320-ft, 7,000,000-cu yd earth and rock dam.

On the other side of the Sierra, work continued on schedule on the **Owens Gorge** project, north of Bishop, Calif. The $45 million Los Angeles Department of Water and Power project includes three identical hydroelectric plants of 37,500 kw each, all of which are scheduled to be in service by the fall of 1952.

In Southern California the Corps of Engineers had the following flood-control work in hand. The big spillway for **Whittier Narrows Dam** was near completion, but much work is yet to be done on the fill. Below this dam a $1.4 million flood-channel contract is under way on the **Rio Hondo.** On the **Los Angeles River,** $4.6 million in contracts was completed in 1951, with $1.9 million in contracts on the upper river to be completed this year. $1.7 million of channel work was completed in **Tujunga Wash,** with $1.7 million yet to be done.

Now 35% complete is the $24-million **Mission Bay** project at San Diego, a combined flood channel, harbor improvement and park development sponsored jointly by the city, the state and the Corps of Engineers.

Central Valley—All the initial features of the Central Valley project of the Bureau of Reclamation now are completed and in operation. These include the **Tracy Pumping Plant, Delta Cross Channel, Delta-Mendota Canal, Friant-Kern Canal** and the **Shasta-Tracy Transmission Line.**

Work is continuing on the **Friant-Kern** water distribution system, which is 15% complete.

Of the flood-control projects being built in the Central Valley by the Corps of Engineers, the $24 million **Pine Flat Dam** contract is 35% complete. Work started late in 1951 on the $5.9 million contract for **Isabella Dam** and on the $29 million contract for **Folsom Dam.** Under earlier contracts, river diversion at the **Morman Island** auxiliary dam is 65% complete. Power phases of Folsom are under the USBR, with construction of the 162,000-kv powerhouse just started.

• **Columbia Basin**—Six of the seven multipurpose dams under way on the Columbia River and its tributaries are progressing rapidly, and the seventh—**The Dalles Dam**—will pass from the planning stage to actual construction early in 1952.

Congressional appropriations for work on these projects during the fiscal year 1952 include: **McNary Dam,** $42.9 million; **Chief Joseph Dam,** $16.9 million; **Detroit Dam,** $17 million; **Lookout Point Dam,** $16 million; **Albeni Falls Dam,** $10 million; **The Dalles Dam,** $4 million; **Lucky Peak Dam,** $3.8 million. With these appropriations, the Corps of Engineers will bring projects in the North Pacific Division to the following status of completion: McNary Dam, 55%; Chief Joseph Dam, 21%; Albeni Falls Dam, 41%; Lucky Peak Dam, 45%; Detroit Dam, 79%.

A 33-FT LIFT will be given river traffic at Jim Woodruff Lock, part of a $46,215,000 navigation-power project in the Appalachicola basin at Fla.-Ga. line.

A $58.5 million completion contract on McNary Dam, largest transaction of the year, was awarded in April. Schedules call for placing two power units of 70,000 kw each on the line late in 1953.

On **Chief Joseph Dam** as the year ended approximately 190,000 cu yd of concrete had been placed inside the first cofferdam on the south side of the Columbia and erection of a second cofferdam was under way. Chief Joseph is expected to start producing power in 1956.

Concrete placing was continued at **Detroit Dam** on the North Santiam River in western Oregon. Additional contracts totaling $9.5 million were awarded for work on Detroit and its reregulating dam, **Big Cliff.** For **Albeni Falls Dam** in northern Idaho contracts for the year totaled $10.3 million and for **Lookout Point Dam** on the middle fork of the Willamette River, $8 million.

Meanwhile in eastern Washington preparations are being made to celebrate delivery of irrigation water in the USBR's Columbia Basin project in May, 1952. Facilities for the irrigation of 82,000 acres will be completed at that time. This marks the initial delivery of water pumped 280 ft out of the Columbia River at **Grand Coulee Dam.** Ultimately 1,029,000 acres will be irrigated, with approximately 55,000 acres scheduled to be brought in for each of the six years succeeding 1952, through 1958. By that time nearly one-half of the project area will be irrigated. Before 1952 is over the installation of six pumps—the largest in the world—is scheduled to be completed at the Grand Coulee pumping plant. Each pump has a capacity of 720,000 gpm. At the beginning of 1951 $110 million worth of contracts were in force on the Columbia Basin project. Major contracts

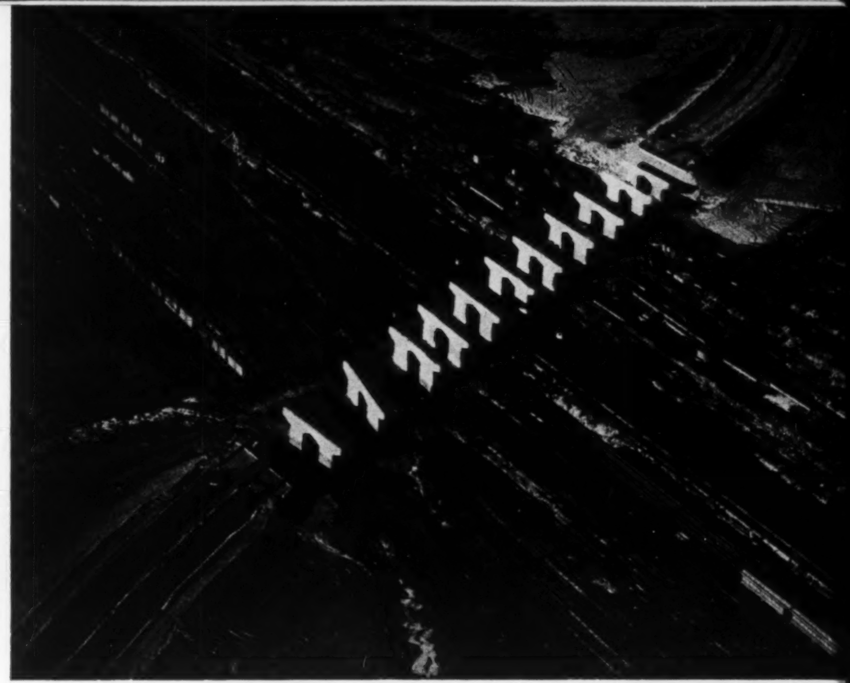
(*Continued on page 145*)

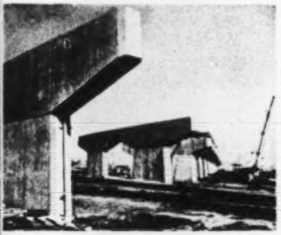
GENERAL CONTRACTOR:
Stock Construction Corp.
New York, N. Y.

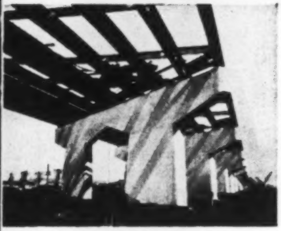
STEEL CONTRACTOR:
American Bridge Co.
Ambridge, Pa.

ENGINEERS:
Howard, Needles,
Tammen & Bergendoff
New York, N. Y.

ARCHITECTS:
Alfred Fellheimer
—Steward Wagner
New York, N. Y.







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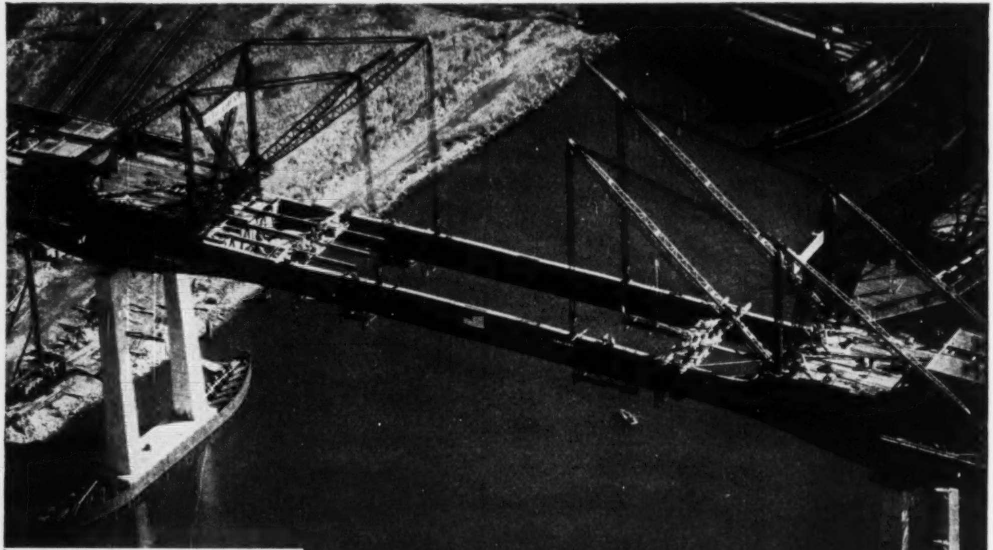

Aerial view of six-lane Passaic River Bridge, showing Bethlehem Steel crew fitting closing girders into place. *Owner:* New Jersey Turnpike Authority; *Chief Engineer:* Charles M. Noble; *Former Executive Director:* W. W. Wanamaker; *Consulting Engineers:* Ammann & Whitney, New York; *General Consulting Engineers:* Howard, Needles, Tammen & Bergendoff, New York.

Travelers on bridge deck, each equipped with two booms, shown raising twin 115-ft closing girders, having a combined weight of 292 tons.

One of four haunch girders, erected over main piers at night because of tide conditions. Girder is 130 ft long, 22 ft deep, weighs 173 tons.

New Jersey Turnpike Crosses Passaic River

Shown under construction, the giant Passaic River Bridge is an important link in the New Jersey Turnpike, the 118-mile limited-access high-speed highway traversing the state. The bridge crosses the river and twenty railroad tracks, and passes beneath the Pulaski Skyway. Over the river it has an under clearance of 110 ft from mean high water. Its approaches extend from a point south of Raymond Boulevard, in Newark, to approximately 800 ft beyond the Newark Turnpike, in Kearny.

The south approach superstructure for the Passaic River Bridge consists of nineteen simply-supported deck-girder spans for an overall length of 2,526 ft. The north approach superstructure has twenty-four similar spans, covering a distance of 3,055 ft.

The 1,365-ft main river portion of the bridge, also of the deck-girder type, consists of five spans. Here the three interior spans are continuous over four supports, with the two extremities cantilevered to carry the two end simply-supported suspended spans.

The Passaic River Bridge has two reinforced concrete roadways, each 36 ft wide, plus a central mall and safety walks. Its 7,000-ft length and 22,000-ton superstructure make it the largest of 24 Turnpike bridges for which Bethlehem fabricated and erected the steelwork.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

FABRICATED STEEL CONSTRUCTION

(*Continued from page 142*)

completed in 1951 were the 25-ft ID, 2½-mile **Soap Lake Siphon,** the second section of **West Canal, Winchester Wasteway** and the 16,000-cfs **Feeder Canal.** Only about 60% of the over-all project construction is complete, however. Among major contracts outstanding as 1952 begins are the fourth section of the **East Low Canal,** $3.5 million; spillway bucket repairs at Grand Coulee (to be completed in winter), $2.7 million; river channel slope protection at Grand Coulee (probably to be completed this winter), $2.3 million; **Frenchman Hills** tunnel, $2.2 million.

Farther upstream on the Columbia River system contractors rushed work on the USBR's **Hungry Horse Dam.** In 1951, 1,378,000 cu yd of concrete went into the structure—including power plant. This brings the dam to 2,401,000 cu yd, leaving only about 700,000 cu yd to complete the work. Capture of 80,000 acre-ft storage during fall rains will permit release during the winter for use in downstream power plants. This storage was accomplished six months ahead of schedule and will help alleviate a brown-out power shortage condition in the Pacific Northwest. Hungry Horse power will be on the line in 1952 with one 71,250-kw generator in October; a second in December.

In other major USBR work in the Columbia River Basin, **Anderson Ranch Dam** was conpleted in 1951 with addition of generating capacity. Two diversion tunnels will be dug in 1952 for the $76 million **Palisades Dam** in eastern Idaho under a contract already let. A prime contract to build the multiple-purpose earth fill structure is planned in the spring of 1952.

The year 1951 saw the first major privately owned hydroelectric construction in the western part of the Columbia watershed since World War II. One of these, Pacific Power & Light's **Yale** hydroelectric development on the Lewis River, was 40% completed by Dec. 31. Full-scale construction on the $26.5 million job began June 1. The first of two 50,000-kw units to be installed now will go on the line late in 1952.

On Washington Water Power's **Cabinet Gorge Dam** project, September, 1952, is the target date for first delivery of power Progress on the $40 million 200,000-kw job is past the 35% mark.

Idaho Power Co. in the eastern part of the basin continues its $95 million development program with $23 million **C. J. Strike** power plant and earth-fill dam on the Snake River (90,000 kw) nearing completion on schedule.

The Chelan County Public Utility District is adding six 27,500-kw units to the power plant at **Rock Island Dam** on the main Columbia River under an agreement with the owner, Pacific Power & Light. Power will be delivered next November to a new $45 million aluminum-reduction plant at nearby Wenatchee, Wash.

HARLAN COUNTY DAM—A $47,000,000 Corps of Engineers project on the Republican River—is virtually completed. It will provide flood control on the Kansas and Republican Rivers and irrigate 90,000 acres of land in Nebraska and Kansas.

The Seattle, Wash., City Light Department spent $9.8 million there during 1951 on rehabilitation of **Diablo Dam,** installation of a new generator in the Gorge powerhouse and beginning of construction on the **Ross** powerhouse of its Skagit River system.

• Alaska, Eklutna power project—A $17.4 million contract was awarded last September for the construction of a 4-mile, 9-ft dia transmountain diversion tunnel, to provide power for the Anchorage area. This is the first major contract ever awarded by the Bureau of Reclamation outside the mainland of the United States. Nearly three years will be needed to complete the tunnel contract, which includes some alterations to **Eklutna Dam.** The $33.8 million project is expected to start producing power by 1955.

• Provo River, Utah—The 40-mg **Terminal Reservoir** (covered concrete), situated at the terminus of the 41-mile Salt Lake aqueduct near Salt Lake City, Utah, was completed on Dec. 6, 1951, at a cost of $1.3 million.

Four days later hard rock tunnel crews completed excavation for the 6-mile **Duchesne Tunnel** 18 miles east of **Kamas,** Utah. The bore makes possible transmountain diversions from the Colorado River watershed to Great Salt Lake Basin. Concrete lining will begin early in 1952 with completion anticipated before the end of 1952, 4 mo ahead of schedule, winding up all construction work on the $30 million project.

• Cachuma Project, Calif—This $34 million USBR project in Santa Barbara County, Calif., will provide water for irrigation and municipal use. It involves the $13 million **Cachuma Dam** on the Santa Ynez River, now 50% complete, that diverts water through the $8 million **Tecolote Tunnel**—57% complete. On the ocean slope, the water is distributed by a system of reservoirs and conduits that to date involve $5.2 million of contracts ranging from 5 to 85% complete.

• Lower Colorado River Basin—At Hoover Dam, installation of three new generators in the Arizona wing of the power plant is nearing completion. These units will go into commercial production during the first half of 1952. **Davis Dam** and power plant are completed and the plant is in operation with an installed capacity of 225,000 kw. The transmission system consisting of 1,500 miles of line (connecting Hoover, Davis and **Parker Dam** power plants with market areas in southern California, southern Nevada and Arizona) is in service. The 18½-mile **Wellton-Mohawk Canal** is completed and the three main pumping plants will be completed early in 1952. Some 40 miles of the **Mohawk Canal** and 11½ miles of the **Wellton Canal** is under construction.

• Southwestern States—Major construction of the Bureau of Reclamation's Region 5 was confined last year chiefly to New Mexico and Colorado. Two important projects were completed; one passed the half-way mark; and construction was started on a fourth. **Platoro Dam** on the Conejos River in south-central Colorado was completed in November at a cost of $3.6 million. It will impound water for irrigating 86,000 acres of land in the San Luis Valley project. Completed in July was a diversion dam and drainage facilities near Fort Sumner, New Mexico at a cost of $2.4 million to provide dependable irrigation for 6,500 acres of land in that section of the **Pecos River Valley.** Initial construction has been started on the $72 million **Middle Rio Grande** irrigation project comprising 80,000 acres of farm land. It is scheduled for completion in 1960. The work involves channelizing a 21-mile reach of the Rio Grande above **Elephant Butte** reservoir.

• **Texas rivers**—By the end of this June $96.8 million worth of construction will be completed or under way on 7 dams being built on Texas rivers by the Corps of Engineers. Total cost of the 7 projects is $126.6 million including $7,500,000 local funds. Largest of the projects is the $42 million concrete and earth-fill **Whitney Dam** on the Brazos River, near Waco, to store 1,631,000 acre-ft of water for flood control and 387,000 acre-ft for hydroelectric power. It is scheduled for completion by June 30. Four projects will control the upper Trinity River watershed. They are: The 33,300-ft long, 125-ft high earth fill **Garza-Little Elm Dam** to provide 526,700 acre-ft of flood control storage and 436,000 acre-ft for water conservation. This $24.6 million project is 23% finished. **Benbrook Dam**—designed to store 170,400 acre-ft for flood control and 72,500 acre-ft for water conservation—is completed. The entire $11.7 million project will be finished by October of this year. **Lavon Dam**, to store 275,600 acre-ft for flood control and 100,000 acre-ft for conservation will be finished by June of next year at a total cost of $11.6 million. Also to be finished by June of next year is the $11.6 million **Grapevine Dam**, to store 238,200 acre-ft for flood control and 160,000 acre-ft for conservation. **Dam B** on the Neches River was completed last year and is now in partial operation. Costing $7.3 million, it will store 94,200 acre-ft of water for conservation and flow regulation. Now 18% finished and scheduled for completion by September 1954, is the $17.8 million **Belton Dam** on Leon River in the Brazos River basin. It will provide 887,000 acre-ft of storage for flood control and 210,600 acre-ft for conservation.

• **Rio Grande**—Good weather and fast construction schedules last year advanced **Falcon Dam**, south of Laredo, Texas, to 34% completion. Under joint construction by the Mexican and U. S. sections of the International Boundary and Water Commission, this $48.7 million project with a 31,500-kw powerhouse on each side of the river, will provide storage for 2,100,000 acre-ft of water conservation and 1,685,000 acre-ft for flood control.

• **Red River** (Texas)—Construction of $33 million **Texarkana Dam**—the largest of five headwater dams being built by the Corps of Engineers to control floods on the Red River below Denison, Tex.—is 25% finished. Last year $5.5 million worth of contracts were awarded, with an additional $2.5 million to be let by July 1 of this year. Located on the Sulphur River near Texarkana, Tex., the 18,500-ft long earth dam will have storage capacity of 2,654,000 acre-ft.

• **Oklahoma Dams** — The $43.9 million **Fort Gibson Dam** project, on the Grand River near Muskogee, is in partial operation for flood control. **Hulah Dam** on the Caney River near Bartlesville also was virtually completed at a cost of $11.3 million. It will store 295,000 acre-ft. The $23.1 million **Tenkiller Ferry Dam** on the Illinois River (in Oklahoma) is 67% finished. By the end of this June $20 million worth of construction will have been placed under contract. It will store 600,000 acre-ft of water for flood control and 630,000 acre-ft for power generation.

• **Arkansas Rivers**—Construction contracts totaling $2.7 million were awarded or completed last year by the Corps of Engineers for work on **Blakely Mountain Dam**, on the Ouachita River, advancing that $32.7 million project to 44% completion. Both of its 37,500-kw generators are to be placed on the line in the third quarter of 1954. **Bull Shoals Dam** on the White River was completed last year in time for flood control. The $76.3 million project is scheduled for completion this fall. It will provide 2,360,000 acre-ft of storage for flood control and 3,048,000 acre-ft for its 168,400-kw hydroelectric plant.

• **Missouri River Basin**—Fiscal year 1950 was considered a big year, constructionwise for the Pick-Sloan Plan for the Missouri Basin with the awarding of $37 million of contracts by the Corps of Engineers. But fiscal 1951 contracts exceeded 1950 by 77%; while those expected to be awarded during the current fiscal year will add up to 40% more than fiscal 1951.

Construction contracts awarded during fiscal 1951 on Corps of Engineer projects in the basin totaled $65.5 million. Of this amount, $54.5 million went for dam construction; the remaining $11 million went for local flood protection at the Kansas Citys, and for agricultural levees, navigational improvement and stabilization of the Missouri River.

Fort Randall Dam in South Dakota, one of the three main-stem dams now under construction, received the largest share of 1951 money—$40.5 million. This $189.2 million project—with its 320,000 kw of installed power and 6,300,000-acre-ft maximum storage—was 46% finished at the close of the 1951 construction season. Additional contracts totaling $34.7 million are expected to be awarded by July 1 of this year. Initial production of hydroelectric power is scheduled for November, 1953.

Garrison Dam in North Dakota is 42% finished. Construction contracts awarded during fiscal 1951 totaled $11.6 million. Last October, a $15.4 million contract was awarded for Stage 4 earthwork (including closure). Additional contracts totaling $21.7 million will be awarded during fiscal 1952. Estimated cost of the entire project, which will have an installed hydroelectric power capacity of 400,000 kw and a total storage of 23,000,000 acre-ft, is $268 million.

Contracts totaling $1 million were awarded during fiscal 1951 for construction of **Oahe Dam** near Pierre, S. D. Still in the initial construction stage, this $245.9 million project will have an installed power capacity of 425,000 kw, and a maximum storage of 23,600,000 acre-ft. Contracts totaling $3,770,000 will be awarded this year for additional excavation and embankment.

A third power unit was completed last year at **Fort Peck Dam** in Montana, bringing its total capacity up to 85,000 kw. **Harlan County Dam** on the Republican River in southern Nebraska is virtually completed. Costing $47 million it will exercise much-needed flood control along the Republican and Kansas Rivers and furnish irrigation water for 90,000 acres in Nebraska and Kansas. Initial construction totaling $2,000,000 will get under way early this year at **Gavins Point Dam** on the Missouri River above Yankton, S. D. The entire project, designed chiefly to regulate upstream releases, is tentatively estimated to cost $44.9 million.

Other major Corps of Engineer projects include: Local flood protection works for the **Kansas Citys**: 56% completed, $5.3 million worth of contracts awarded in fiscal 1951, and $4.5 million to be awarded by July 1 of this year. Total cost will be $41.4 million federal plus $3.1 million local. Agricultural Levees (Sioux City to the mouth of the Missouri): fourteen units costing $23.8 and totaling 240 miles completed or substantially advanced; $4.5 to be awarded this year; project cost, $124.8 million federal and $10.5 million local.

The Corps of Engineers' $285.4 million Missouri River navigation and stabilization project is 65% finished. During fiscal 1951 contracts totaling $5.5 million were awarded for this work, with an additional $6.3 million expected to be awarded by July 1 of this year.

Contracts for additional construction totaling $18.2 million were awarded last year in the Bureau of Reclamation's Region 6 (the Dakotas and parts of Wyoming and Montana). **Boysen Dam** on the Big Horn River in Wyoming will be completed this year at a cost of $34.7 million. Benefits include silt retention and regulation of the river flow permitting irrigation of 120,000 acres of new land, plus a 15,000-kw power plant.

Keyhole Dam on the Belle Fourche River in Wyoming is 78% finished. This $4.4 million project will furnish flood protection along the Belle Fourche, provide irrigation of 55,700 acres of addi-

(Continued on page 148)

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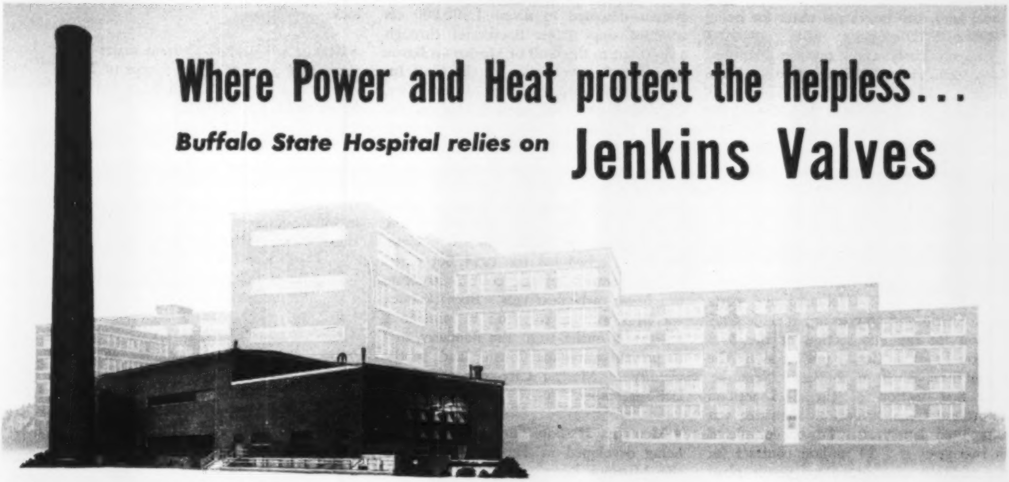

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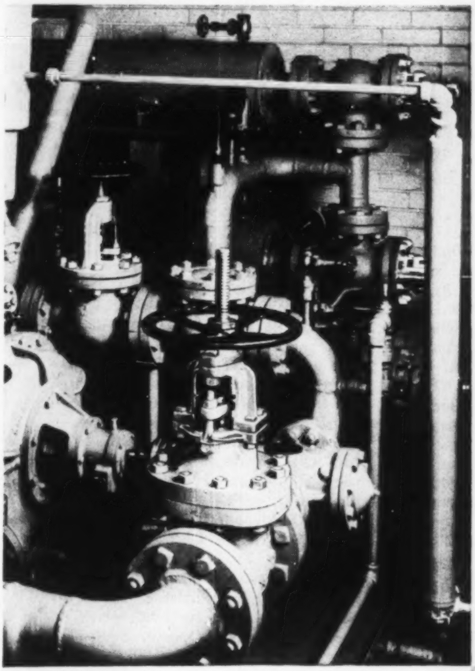

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(*Continued from page 146*)

tional land, and municipal water for Belle Fourche, S. D.

Canyon Ferry Dam on the Missouri River near Helena, Mont., is over 50% finished. Completion of the $29.5 million project is scheduled for 1954. Its storage capacity of 2,050,000 acre-ft will provide irrigation water for 310,000 acres of new land and supplement water for 196,000 acres now under irrigation, also water for generating 50,000 kw.

Major Missouri River Basin construction, exclusive of the Colorado-Big Thompson project, to be placed under contract this year in the Bureau of Reclamation's Region 7 (Nebraska and parts of Colorado and Wyoming) include $1.5 million for the first section of the $5.8 million **Franklin Canals** project along the Republican River in southern Nebraska. The first section of the $8.5 million **Courtland Canal** project in that area was completed last year. To be completed in two years is a $4 million contract for the addition of a 24,000-kw power plant at **Alcova Dam** on the North Platte River in Wyoming. Two big dams completed last year in Region 7 are: the $14.7 million **Cedar Bluff Dam** on the Smoky Hill River in Kansas, to store 373,850 acre-ft of water; and the $9.8 million **Bonny Dam** on the South Fork of the Republican River in Colorado, to impound 175,000 acre-ft of water. **Trenton Dam** on the Republican River in Nebraska is 50% finished, with completion scheduled for this summer. The dam will cost $15 million; railroad relocations, $5.7 million; and highway relocations, $1.2 million.

- **Colorado-Big Thompson** – Construction contracts awarded or completed last year totaled $13.7 million. Three major units are scheduled for completion in the spring of 1953. They are: The $32.5 million **Estes Foothills Power System,** now 74% finished. This project includes two power plants of 96,250-kw combined capacity, and a series of 9-ft tunnels and canals carrying water from Estes Park, Colo., to Horsetooth and Carter Lake. **Carter Lake Reservoir** is 62% finished. The third major project is **Willow Creek Dam,** including pumping plant and feeder canal estimated to cost $5 million.

- **Lower Mississippi**—Last year the Corps of Engineers completed or awarded $4.3 million worth of levee construction and $9.3 million of bank stabilization along the Lower Mississippi River (below Cairo); and $2.3 million of flood protection works on tributary streams. Contracts for this type of work to be let by July 1 of this year will total $2.4 million. **Algiers Lock and Canal,** being built below New Orleans to facilitate traffic on the Gulf Intracoastal Waterways, is 32% finished.

- **Atchafalaya Floodway**—Latest project to be started in the Atchafalaya floodway system—designed to divert 1,500,000 cfs of Mississippi River floodwater through a short cut to the Gulf of Mexico—is **Bayou Boeuf Lock** in a section of the Gulf Intracoastal Waterway east of Morgan City, La. Work has just been started on the initial $2.4 million construction contract; with project completion scheduled for 1954. The 4,000 ft long control structure for the **Morganza Floodway**—a component of the Atchafalaya floodway system designed to divert 600,000 cfs of the total diversion—is 52% finished. Completion is scheduled for 1954 but emergency operation of the control structure can begin early next year. **Berwick Lock**—a $1.5 million structure to provide a navigation outlet from the floodway, and to prevent water overflowing lands in the vicinity of Morgan City—was completed last September.

- **Memphis Harbor**—The off-river harbor being developed in Tennessee Chute of the Missippi River at Memphis, Tenn., is 35% finished. To be completed in 1958, the project is estimated to cost $21.6 million federal funds and $28 million local funds. Flood protection works for Memphis—including 10 miles of earth levees, 3 miles of floodwall, 8 storage reservoirs and 6 pumping stations at a total cost of $13.4 million—is 58% finished.

- **Yazoo River Basin**—The $34.7 million **Grenada Dam** project on the Yalobusha River near Grenada, Miss. is 52% finished, with completion scheduled for late next year. The dam is a 13,900-ft long, 100-ft high earth fill, with a 200-ft wide uncontrolled chute-type concrete spillway. **Enid Dam** on the Yocona River—an 8,400-ft long, 106-ft high earth fill—will be finished this year at a total project cost of $15.3 million. Local protection works in the basin, costing $5 million for 32 miles of levees and floodwalls, 67 floodgates and 3 pumping plants, are 36% finished.

- **St. Anthony Falls**—Construction of the $6.9 million, 400x56-ft lower locks and dam, is 14% finished. When completed in 1957 the $20.5 million project will extend the present 9-ft deep Mississippi River channel 4.6 mi above the present head of navigation at Minneapolis, Minn.; providing an area for terminal development in the industrial center of the city. Yet to be started is a second lock providing a 49-ft lift; the highest lift on the Mississippi.

- **Chain of Rocks**—Now 87% finished, this $39.8 million project to improve navigation on the Mississippi by by-passing the treacherous reach at Sawyer Bend above St. Louis, is scheduled for completion next year. The project involves an 8-mi lateral canal; a 1,200x110-ft main lock; and a 600x110-ft auxiliary lock.

- **Middle Mississippi**—Current major flood protection projects of the Corps of Engineers along the Mississippi River between Alton and Gale, Ill., total 17. They vary from 18 to 98% finished. Contracts awarded last year totaled $10.1 million; with about $10.8 million of new contracts to be awarded this year. The entire project—costing $64.4 million and including levee enlargement and construction, closure structures and pumping plants—will give flood protection for 300,000 acres of rich farming land, including a highly industrialized area at East St. Louis, Ill.

- **Ohio River Basin**—The Corps of Engineers in the Ohio Valley had work under way on some $358 million worth of major river projects at year's end. Major dams worth $267 million, $51 million worth of local flood protection jobs and $40 million worth of navigation lock work were all in some phase of construction.

In Pennsylvania, 42 miles above Pittsburgh, the $49 million **Conemaugh Dam** on Conemaugh River, to cut flood crests in the upper valley, is over 95% finished.

On the Cumberland River in Kentucky, the $82.7 million **Wolf Creek Reservoir** is 90% complete. It will store over 6,000,000 acre-ft. Six power units, 270,000 kw in all, are half on the line; remaining three units will go into operation this year.

In Tennessee, on Caney Fork River, 27 miles above where it joins the Cumberland, the third of three 45,000-kw units at **Center Hill Dam** went on the line in 1951.

One of the big items in the 1952 appropriation made last fall was a fund to start work on $50.6 million **Old Hickory Lock and Dam,** 23 miles above Nashville on the Cumberland. The major construction contract has been let. Ultimately there will be four 25,000-kw power units.

In Indiana, on a tributary of the Wabash River, $6 million **Cagles Mill Reservoir** for flood control was over 70% finished Jan. 1.

Local flood protection projects on the Ohio River include $29.7 million worth at **Louisville, Ky.,** 12.8 miles of levee, 4.5 miles of concrete wall and 14 pumping stations; 55% completed. At **Maysville, Ky.,** another $6,619,000 worth is over 20% finished. Opposite Louisville, **New Albany, Ind.,** is getting $6.7 million worth of flood protection, now some 40% finished. A $4.5 million project is over 30% done at **Ashland, Ky.** And on the Wabash River, **Vincennes, Ind.,** is due to get a local floodwall job under way this spring.

Navigation lock projects include reconstruction of **Locks No. 2** on the Monon-

(*Continued on page 151*)

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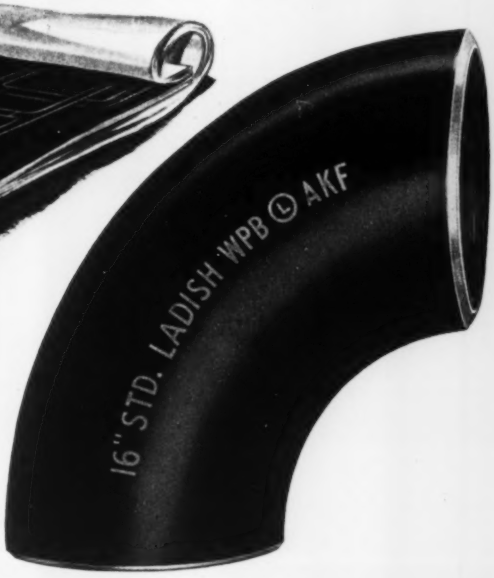

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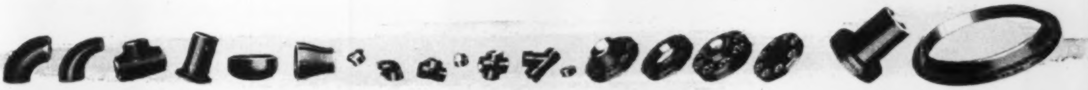

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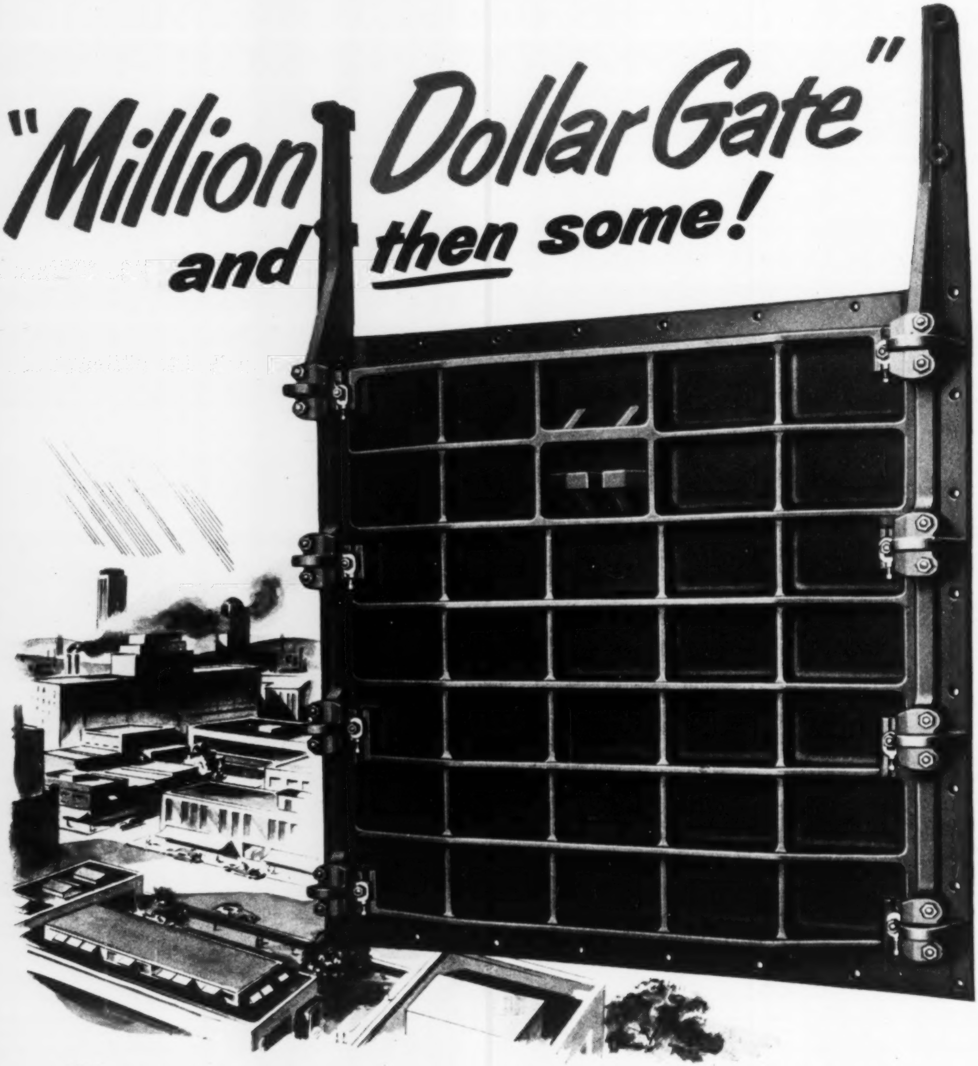

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(Continued from page 148)

gahela in Pa., just south of Pittsburgh. The $16.9 million job was near 60% finished Jan. 1—replacement of an obsolete structure as its purpose. **Cheatham Lock and Dam** on the Cumberland 42 miles below Nashville, Tenn., is over 27% completed. The $14.2 million project will provide a 9-ft channel to Nashville and eliminate two old locks.

- **Tennessee Valley**—The Tennessee Valley Authority's **South Holston Dam,** an earth and rock structure, was completed at a cost over $30 million on the South Fork of the Holston River in northeast Tennessee. **Boone Dam,** a concrete and earth-fill structure, was well along on the same stream with three 25,000 kw power units due to be installed starting this year. Its cost will be $24 million. A third Holston-basin installation is **Fort Patrick Henry Dam** on which construction just began in 1951. It will cost $14 million and support two 18,000-kw units.

The TVA also made the following additions to existing plants: The last two of six 36,000-kw units at **Pickwick;** the fourth of four 24,300-kw units at **Guntersville;** and the fourth of four 27,000-kw's at **Chickamauga.** And at **Hales Bar Dam** recent modernization has allowed addition of two 24,300-kw units, installation of which will finish this year. Work is getting under way on filling out power plants at **Cherokee, Douglas** and **Fontana** dams.

- **New England—Mansfield Hollow** flood-control reservoir on the Natchaug River in Connecticut reached 90% completion last year and is due to be finished in 1952, according to the Corps of Engineers. This $7.2 million project includes a rolled-earth dam 12,400 ft long plus another 2,610 ft of dikes. Its spillway section, across the river's channel, is concrete.

- **New York State**—The Corps of Engineers intends to have the remaining 3% of **Mt. Morris Dam** construction completed by June 30 on the Genesee River, south of Rochester. It is a $24.7 million flood control project (no power) that will back up a 17-mile lake behind a 200-ft dam to regulate flow in the erratic northbound stream.

- **Southeastern States**—Last year saw **Jim Woodruff Lock and Dam** advanced from 22 to 32% of completion at the Fla.-Ga. state line, where the Chattahoochee and Flint rivers join to form the Appalachicola. The lock and spillway of the $46.2 million project are to be completed this quarter, and final major contracts on the gated spillway and power plant have just been let.

Upstream on the Chattahoochee, 35 miles northeast of Atlanta, Ga., $41 million **Buford Dam** was 5% done by year's end. It will have 86,000 kw of hydro capacity when finished.

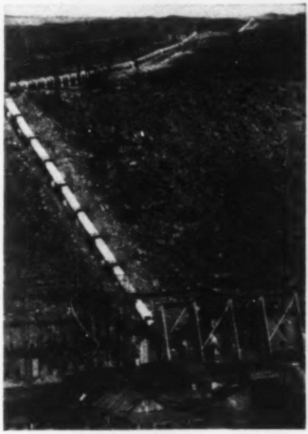
Demopolis Lock and Dam 218 miles above Mobile, Ala., a $20.3 million project on the Tombigbee River went from 5 to 14% completed through 1951. The 110x600-ft lock with its 40-ft lift will replace four existing locks on the stream.

On the Savannah River above Augusta, Ga., $80 million **Clark Hill Dam** was completed last year. Its 7-unit, 280,000-kw power plant is expected to supply power to the nearby Savannah River (hydrogen bomb) Plant of the AEC.

On the Roanoke River in Virginia near the N. C. line, $79 million **Buggs Island Dam** was virtually completed and work continued on the 204,000-kw power plant.

All these river projects in the Southeast are Corps of Engineer jobs.

- **Central Florida**—The Corps of Engineers received bids Feb. 8 on the last 10.9 miles of the 135 miles of levees to form reservoirs in the region behind the Lower Florida East Coast cities from the shores of Lake Okeechobee to a point southwest of Miami. The entire project is estimated to cost $208 million. Congress has approved spending $68 million for work on the project so far. Work during the first three years of the project is intended to protect the coastal cities and farm land from flooding. It includes, in addition to the levees, enlargement of existing canals, construction of new canals and control structures. Work on 50 miles of levees has been completed; work on about 74 miles is under way, with contracts from 33 to 95% complete.



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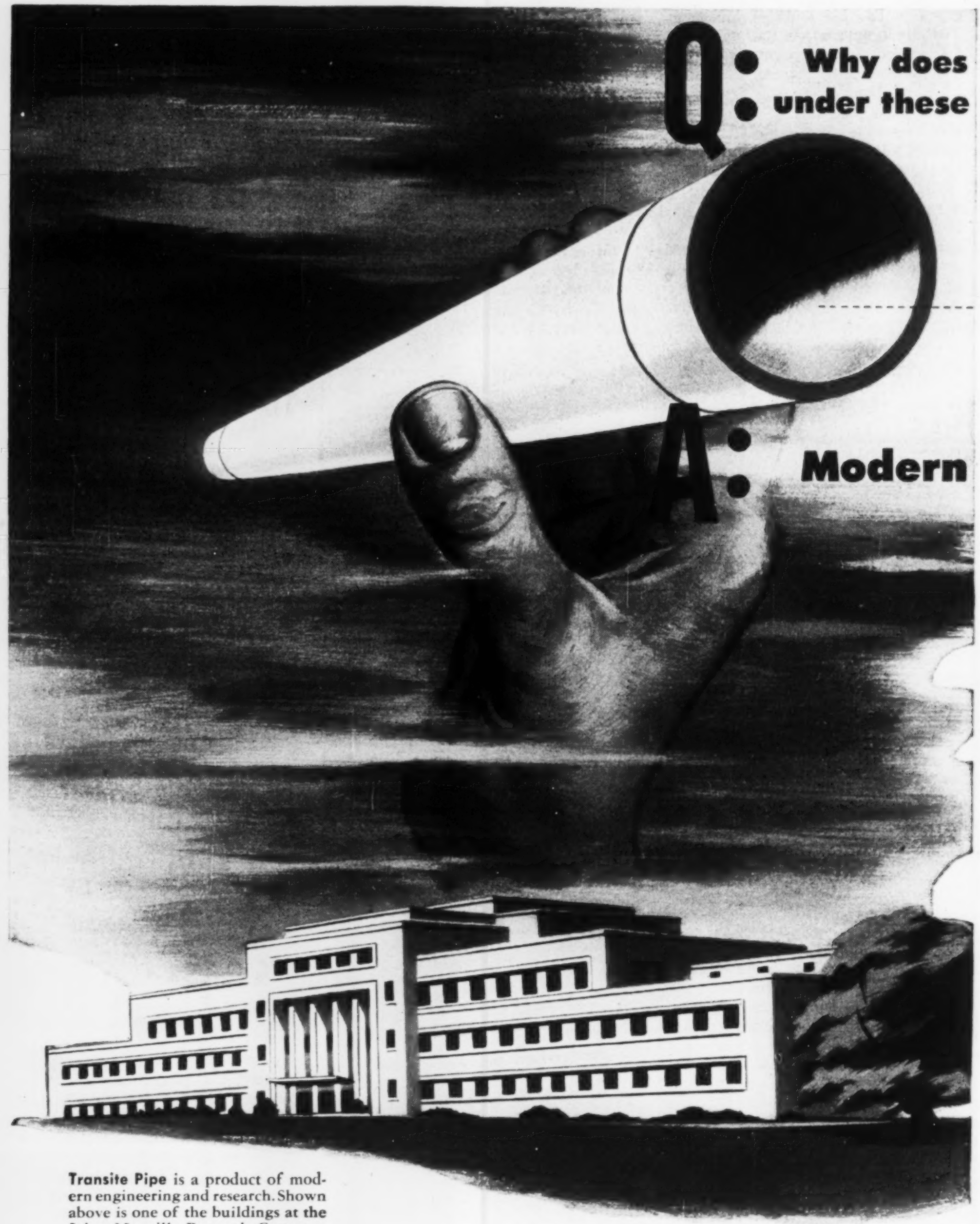

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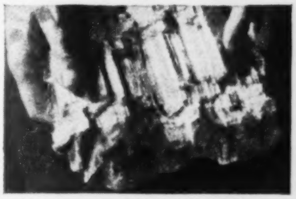

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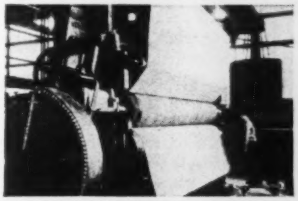

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Transite's flexible Simplex Couplings help relieve the line of excessive flexural stresses—an added safeguard against pipe failures.

asbestos-cement PRESSURE PIPE

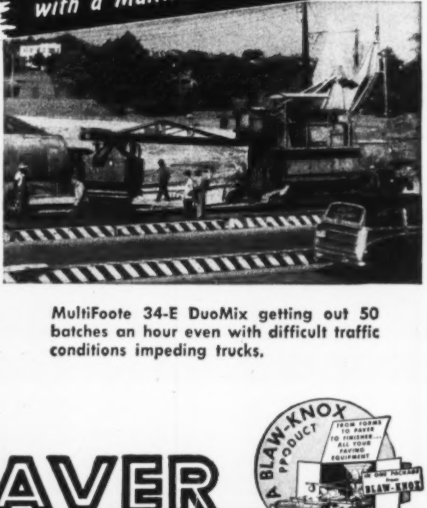
for REACH and SPEED
—the paver for *any* pouring job!

LOOK at the picture above—one machine that can place itself in any location—no expense for purchase or operation of a hoisting mechanism—no extra cost for truck equipment—minimum operating crew! Here is pouring at low cost.

MultiFoote brings you the greatest combination for mixing and pouring concrete you can find anywhere. One unit with the MultiFoote HighLift Boom permits you to mix and pour three stories up and then by simply lowering the boom or with a simple change in booms where extra long HighLift Booms have been used, you are equipped for pouring slab at a speed that has seldom been equalled.

MultiFoote Pavers have established records for pouring slab at the rate of a mile a day. With the MultiFoote you are ready to bid on a wide range of contracts and three sizes of MultiFoote Pavers from a 27-E Single Drum to the big 34-E DuoMix care for practically any capacity problem. Ask for details.

FREE YOUR CRANE for other Work with a MultiFoote HighLift Boom



MultiFoote 34-E DuoMix getting out 50 batches an hour even with difficult traffic conditions impeding trucks.

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Subsidiary of Blaw-Knox Co.
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A BLAW-KNOX PRODUCT
FROM FORMS TO PAVER TO FINISHER... ALL YOUR PAVING EQUIPMENT
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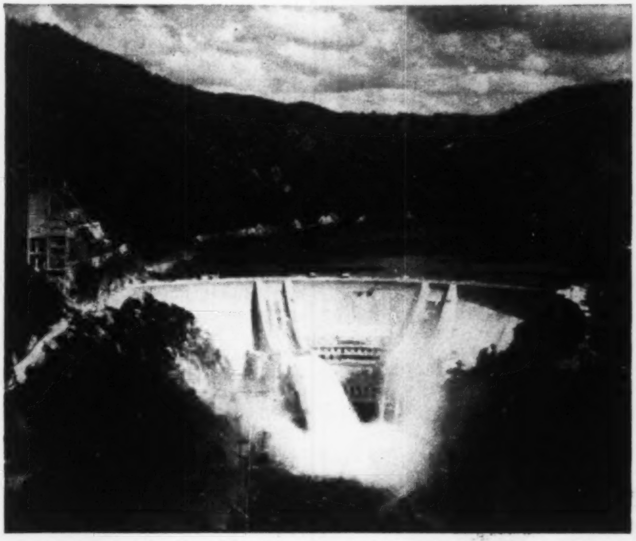


FRANCE'S LATEST DAM. Chastong on the Dordogne River, will soon be turning out power from its two 90,000 kw turbines.

New power to increase production grows steadily in European countries

To complete her defense program and further improve her standard of living, Western Europe must expand production there by a further 25% in the next five years, the Organization for European Economic Cooperation declared in adopting its program for boosting European output. More power is vital to this program even though by 1951, European electric power production had more than doubled from the prewar period.

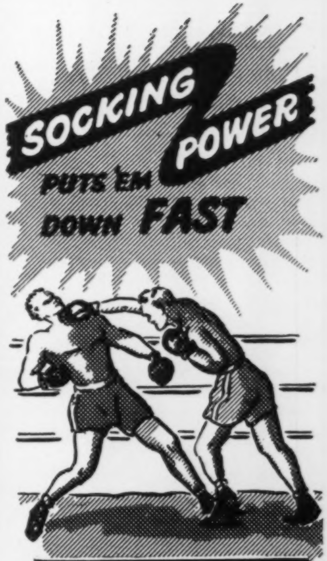
When the ECA program started in 1947, an 8% annual increase in power production was set as a target. This has been met, yet industrial demands indicate that the gross deficit in 1951 with all hydro plants functioning under normal water conditions, was 3,500,000 kw. Present estimates are that this deficit will grow to 4,700,000 kw in 1954 despite the best possible efforts at building new facilities. Most serious shortages occur in the United Kingdom, Italy, Germany and the Netherlands, with less serious shortages in Austria and Greece. Under normal hydro conditions, on the other hand, Belgium and France show a substantial surplus of capacity over the estimated peak load for 1951 through 1954.

The Marshall Plan's contribution to the great increase in electric generating capacity has been considerable. It has taken the form of direct dollar aid totaling $158 million and the allocation of European local currency "counterpart funds" equivalent to $980 millions up to August 1951, for electric, gas and power facilities.

Early emphasis was placed on the completion of large projects, such as dams already partly constructed, and in purchasing from the U. S. such immediately usable equipment as generators for thermal plants. The ECA has encouraged European governments to give electric power projects high priority and to interest private capital and the International Bank of Reconstruction and Development in backing specific projects.

- **France is a leader**—In France alone a total of approximately $1 billion has been spent on power, of which ECA contributed $38 million in direct dollar aid and $500 million in counterpart funds accumulated under the

(Continued on next page)



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SAVE ON MATERIALS—Steel Forms give you more uses—Many times more than wood . . . . Can be reused indefinitely, year after year on job after job . . . . Many contractors report 400, —500 uses and more. No joists needed on slabs . . . . No girts on walls.

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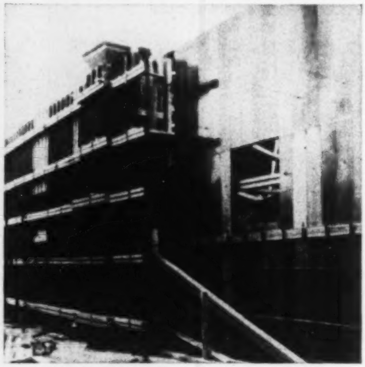

You don't have to buy new forms for every job. Atlas Speed Forms are interchangeable for use again and again on slabs, walls, circular tanks, manholes, modular structures.

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Atlas *Labor-Saving* Concrete Forms for every Purpose

Compressed Air to handle most jobs For Less!

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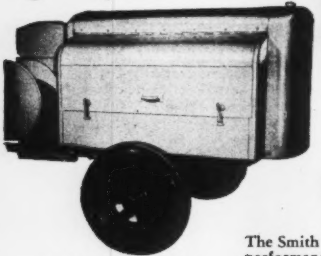
MODEL 105-P

AIR COMPRESSOR



Model 105-P. Has self-starter, battery ignition, voltage regulator, large radiator capacity with thermostat for quick warmup.

The Smith 105-P delivers smooth power, gives long performance, and will handle most of your compressor work, for less! Powered with Chrysler Ind. 15 Industrial Engine with 377 cu. in. displacement. Delivers 105 cu. ft. per minute. Has sodium cooled valves and Stellite valve seats in engine. Stainless steel disc type valves and Manganese Bronze seats in compressor. Heavy duty with light weight (2100 lbs.). *Write for literature and prices.*

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Marshall Plan. The money has gone into hydro plants on all of the river systems, particularly the Rhone and the Dordogne, and into steam power plants in the country's coal fields (ENR April 5, 1951, p. 50). Genissiat Dam on the Upper Rhone is already producing nearly 2 billion kwh annually, and another output of like amount is promised by the Donzere-Mondragon project now under construction farther downstream (ENR Nov. 22, 1951, p. 30). And on the Dordogne four new dams will be accounting for another 2 billion kwh output next year (ENR May 10, '51, p. 28).

In Austria allocations of counterpart funds for the completion of power projects and for equipment of power plants totaled the equivalent of $55,000,000 as of June 30, 1951. The Kaprun project in the Austrian Alps with its 129-mile power line reaching toward Vienna will ultimately produce 600 million kwh of energy per year—10 percent of Austria's total power production. Limburg Dam, the first of several on the project, was completed last September and permits the operation of four generators totaling 200,000 kw. More than two-thirds of the cost of the project so far has been borne by counterpart funds. The plant operates under the extremely high head of 2,775 ft (ENR Nov. 29, 1951, p. 50).

At Braunau, on the Austrian-German border, construction of a run-of-river generating station on the River Inn has been started by the Austrian-Bavarian Power Co. Total generating capacity will be 96,000 kw in four units of 24,000 kw each. Two units will furnish power to the Bavarian network and two to the Austrian network. Total cost is estimated at $28.6 million. Dollar financing in the amount of $570,000 was approved by ECA this year to purchase construction equipment in the U. S.

• **Northern Italy plants**—In Italy the Societa' Idroelettrica Piemonte of Turin received a loan of $6,215,000 in 1950 for the purchase of a complete 60,000-kw steam power plant. This plant will provide steam support for the hydro-electric power system of Northern Italy, and will reduce industrial power cuts due to seasonal hydro-electric deficiencies. Turin, one of Italy's most important industrial centers, has suffered greatly from power shortages since the war and this unit will help relieve the situation. Altogether Italy spent $136 million on power projects up to June 30, 1951, of which ECA contributed $66 million.

In Denmark a ten-million-dollar addition to the Kyndby power plant in Zeeland is scheduled for completion in 1952. The Kyndby plant works in parallel with two other plants in Zeeland and hydro-electric lines from Sweden to supply about 90% of the power used in the eastern part of Denmark. Half the cost of this project is being borne by the Marshall Plan. The expansion at Kyndby is a significant part of a long-term Danish government program to make Denmark independent of small-scale, uneconomic power plants.

• **Hamburg's comeback**–In Germany, expansion of the East Hannover steam power station aided the rapid comeback of the key port of Hamburg. A Marshall Plan allocation of $2.4 million of counterpart funds made possible the expansion of the East station from 70,000 to 140,000 kw.

An additional $2.8 million counterpart fund allocation covered major construction costs of a new 110,000 kilowatt double circuit line from East Hannover to Hamburg, over which the station's output was transferred to the German power grid. Total cost of the two projects amounted to $6.4 million, of which $5.2 million came from the Marshall Plan counterpart funds, remainder from private sources.

There is some interchange of power between neighboring European countries, but not sufficient to reduce deficits substantially. Morever, surpluses in one country and deficits in another are not necessarily simultaneous, so that even complete interconnection will not solve the problem entirely. Accordingly, the Economic Co-operation Administration, now the Mutual Security Agency, has strongly encouraged the construction of new power plants in the countries having the largest deficits as well as in those able to contribute most through inter-connections. Also construction of thermal plants has been stressed in order to achieve a better balance between thermal and hydro-electric sources of power and to prevent subsequent seasonal deficiencies.

In the 9-year period, 1938-47, Europe added 11,650,000 kw to her capacity. Since the beginning of 1948, Europe has added 18,400,000 kw–at the rate of 4,600,000 kw a year.

International bank helps Mexico develop power

By 1955 Mexico will have an estimated electric generating capacity of 1,850,000-kw–nearly half is being financed by the International Bank for Reconstruction and Development.

Most recent of three international bank loans made for electric power

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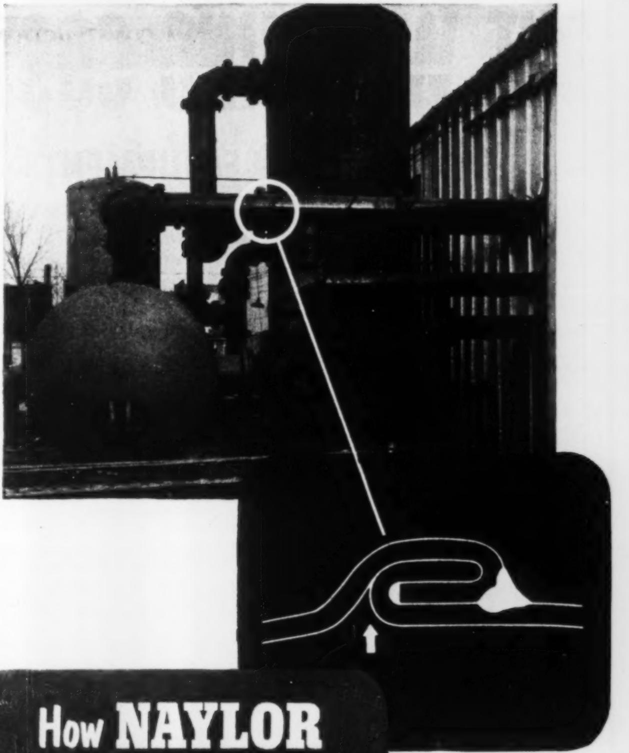
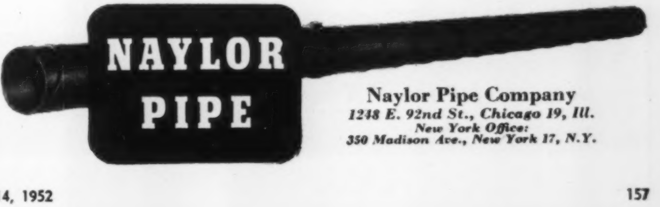


How **NAYLOR** gives you **EXTRA SAFETY** in Light-weight Pipe

This simple sketch gives you the inside story on the extra safety built into every section of Naylor light-weight pipe. The arrow points to the "heel" which extends the entire length of the pipe in spiral form. This acts as a continuous expansion joint absorbing shock loads, vibration, expansion and contraction stresses and strains which are so often destructive to welds on a rigid structure. No other light-weight pipe can match this performance. That's why so many engineers depend on Naylor Pipe on construction jobs. Write for Bulletin No. 507.



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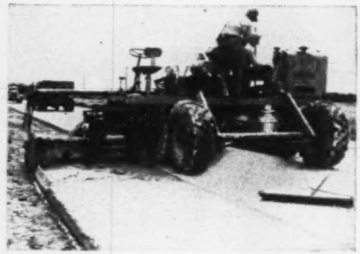

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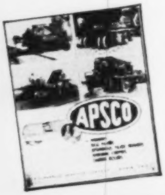
Handles most every aggregate including concrete—fills trenches 2′ to 10′ wide. (Concrete to 6′ wide—*no forms required*) Capacity up to 150 ton per hour and on up to 200 tons per hour building shoulders.



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International . . .

development in the country was completed Jan. 11 in Washington. Total investment is $79.8 million, of which $26 million is being used by a power company and the remainder by a federal commission.

Latest loan was for $29.7 million to Mexico's Federal Electricity Commission. It will be used to finance imports of equipment and materials needed to carry out seven major projects in the 1952-55 construction program of the commission. Projects will include two hydroelectric projects, one of 150,000 kw capacity and the other of 55,000 kw capacity. Four steam plants will have capacities ranging from 30,000 down to 2,500 kw. Seventh project involves considerable extension of distribution systems in the state of Sonora.

Largest of the hydroelectric plants is to be built at Tingambato in the state of Mexico. It will be the largest in the country as well as the largest unit in the commission's "Miguel Aleman" system, which supplies part of the power used in the Mexico City area.

A portion of the bank's earlier loan of $24.1 million to the commission made in January, 1949, was used to help build other plants in the system.

The bulk of the output of the Aleman System is bought and distributed by the Mexican Light and Power Co., Ltd., which also produces and distributes its own power. Additions to Mexlight's installations are being financed by an International Bank loan of $26 million made in April 1950.

International Bank explained that the Mexican commission normally confines itself to providing such needed increases of generating capacity as the companies themselves are unable to finance, and to selling the power produced to the companies for distribution through their networks. Elsewhere, especially in rural areas, where there is no organized supply of power, the commission undertakes the retail distribution, as well as generation, of power.

Even by increasing Mexico's generating capacity from one million kw in 1948 to 1.85 million in 1955, it is estimated there will be no more power than is needed to cover the most essential requirements.

Russians are completing the Don-Volga Canal

Accordling to the Soviet press, the Soviet government later this year will put into operation the Volga-Don Canal to permit continuous passage of sea-going vessels through the heart of

Russia between the southern and northern seas bounding the Soviet Union.

Construction on the canal was begun secretly in 1948. It is about 60 miles long, and from the Don it first traverses hilly country before reaching the lower level of the Volga. There are four locks on the Don side and nine on the Volga side. Ships traveling north are first raised 144 ft to the water divide and then lowered 72 ft to the level of the Volga.

Water for the canal—Russia's equivalent of the Panama Canal—will be pumped in from the Don River by three large stations now being finished.

International Briefs

- **Iranian water wells**—To help meet the critical need for water in Iran well-drilling is being undertaken under the Point 4 program. A contract has been signed with J. L. Richards, an American contractor who has been at work in Iran for nine years. The wells will be drilled to an average depth of about 200 ft. They will have steel casings, a concrete-based well house, diesel-powered pump, and a simple distribution system to bring clean water into the village. Plans are in preparation whereby maintenance and operating costs will be borne out of revenues from water rentals or payments. The rights to the wells, the well-site, and water rights are to be held in perpetuity by villagers through cooperative arrangements.

- **Progress at Owens Falls**—The foundations have been laid at Jinja, Uganda, in Central Africa for the first 15,000 kw generator on the White Nile, thus marking a new phase in the giant Owen Falls hydroelectric scheme. About two years ago the Uganda Electricity Board began the construction of the 2,725-ft dam which will harness the White Nile at its source and provide a power capacity of 150,000 kw. Meanwhile the tension in Anglo-Egyptian relations has stopped all contact between British and Egyptian irrigation experts in working out an overall plan for harnessing the Nile River for the benefit of the countries lying on its banks.

- **Punjab road-building record**—A total of 474 miles of new roads was built in 1950-51 by the building and roads branch of the Public Works Department of Punjab Province, Pakistan. This equals the total constructed in undivided Pakistan during the six years prior to partition. The province has approved a 6-year road development plan which would add 4,300 miles of all-weather roads.

FROZEN FOODS
SOAP
10

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CLEAR SPAN TIMBER ARCHES

Los Angeles market building using glued laminated 74' timber arches designed and fabricated by Summerbell Roof Structures, Inc., Los Angeles.

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And to aid the construction industry, timber fabricators in all sections of the country are supplying prefabricated, ready-to-erect timber roof trusses and framing members.

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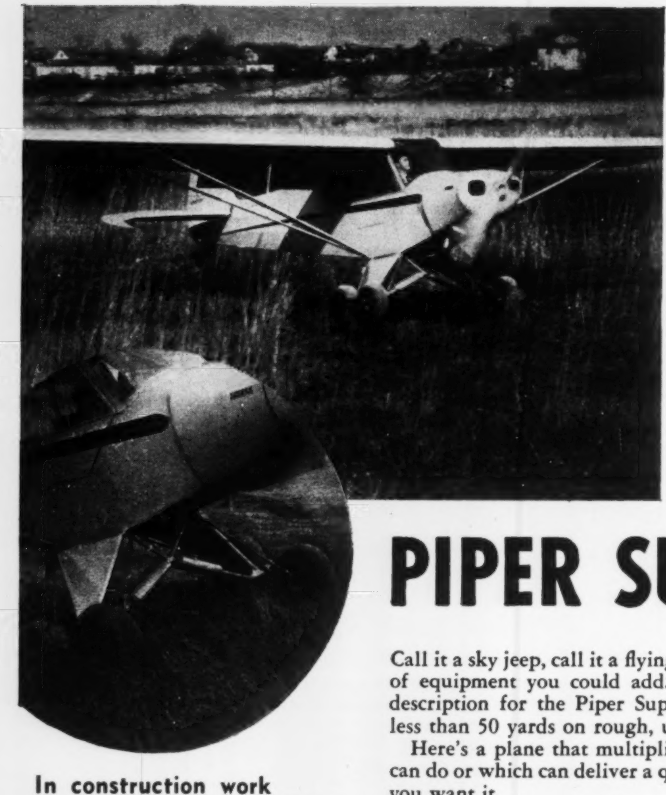

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Call it a sky jeep, call it a flying truck, call it the most useful piece of equipment you could add. In any case, you have the right description for the Piper Super Cub that takes off or lands in less than 50 yards on rough, unprepared ground.

Here's a plane that multiplies the work supervisory personnel can do or which can deliver a quarter-ton of freight right to where you want it.

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In construction work Pipers are in wide use for

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Tri-Pacer model with tricycle gear and simplified controls is so easy to fly that people have soloed it after one day of instruction.

Boston may have a "Radio City" too

With the offer of the Boston and Albany Railroad to sell a 28-acre tract in the exclusive Back Bay section of Boston, Mass., Mayor John B. Hynes and other citizens of the Hub have made plans to buy the site to construct a $75-million edifice similar to Rockefeller Center in New York.

The proposed structure would consist of six buildings for commerce, recreation and daily living, a 200 by 300-ft outdoor, year-around skating rink, two 20-story office buildings, a 12-story, 1,500-room hotel, and a central plaza on sunken terrain between Huntington Ave. and Boylston St., east and west, and Exeter and Dalton Sts., north and south.

The 700 by 800-ft center rectangle forming the plaza itself would contain a 10,000-seat auditorium building, including offices and permanent exhibition quarters. There would also be an international house and a horticultural hall.

• New streets needed—The center would require three additional streets. West Newton St. would be extended across Boylston St. opposite Gloucester St.—in front of the hotel and office building. Another new street would connect Huntington Ave. and Boylston St. between Exeter and Fairfield Sts. as one boundary of the plaza, in front of the East office building. The third street would connect the first two in front of the New England Industrial Building, which would take the place of the present Mechanics Building. The city would be asked to widen Gloucester St. from Boylston to Beacon to make easy access from Embankment Road.

This proposed development results from the efforts of the "New England Town and City" with the cooperation of Fay, Spofford and Thorndike, engineers, and Architect Harold C. Knight.

• Banker conceived idea—One feature, the International House, was conceived by Ralph M. Binney, president of the Boston Chamber of Commerce and vice-president of the First National Bank of Boston.

In a meeting with John D. Rockefeller, Jr., Mayor Hynes suggested that the latter finance the proposed center. However, Mr. Rockefeller said that at present he is engrossed in too many other projects. It is the hope of the mayor and committee to interest other capitalists. The mayor has appointed a planning board to study the proposition. Thomas F. McDonough is chairman; Robert Morgan represents the banking group; R. S. Robie, the New England Council; Frederick C. Church, Greater Boston Development Commission; Paul Clark, president of the John Hancock Insurance Co., D. B. Stanbro, Hotel Men's Association, Irwin Canham, Christian Science Corporation; Arthur P. Wilcox, or John C. Kiley, Boston Real Estate Board, Frederick J. Adams, Massachusetts Institute of Technology, Wm. L. C. Wheaton, Harvard University; Walter E. Brown, recreation industry, Harold Plotkin, Back Bay Association, and Samuel G. Fish, secretary.

Toledo plans repairs to crumbling sewers

Repair of two projects built years ago is planned for 1952 by Toledo, Ohio, officials. Surveys show there is a crack in a 60-in main sewer located about 30 ft underground. The sewer was built in 1860 with ft-thick brick walls. Collapse of the sewer would endanger sanitary and storm sewer facilities in both the downtown area and the west end.

Some attempt in recent years has been made to brace the sewer with wooden beams near the Water St. outlet. The beams occupy about 25% of the available cross section.

Engineers propose to tear out sections of the old sewer and replace the brick walls with metal liner plate. This would increase the sewer to 72 in. Removal would be made in 18-in sections. Cost was estimated at $150 per lin ft.

Arterial highway system planned for Youngstown

The city of Youngstown, Ohio, where some 20,000 vehicles daily are forced to go through the downtown district because of lack of alternative thoroughfares, has received preliminary plans for an arterial highway system to route traffic over and around the downtown district and congested places. The plan, prepared by Parsons, Brinckerhoff, Hall & Macdonald, of New York, contemplated construction of a 5,000-ft viaduct to span the city's downtown section, and to cost an estimated $4.5 million.

(*Continued on next page*)

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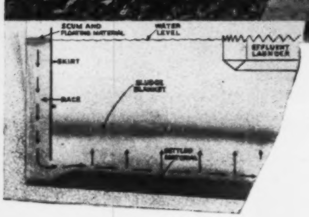
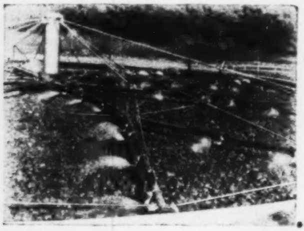
. . . especially in the treatment of strong industrial wastes

Low construction cost . . . low operating cost . . . high purifying efficiency: these are the characteristics of the Yeomans "Spiraflo" Clarifier and the "Aero-Filter System," whether used separately or in combination.



"SPIRAFLO" CLARIFIER—Unusual functional design makes this unit a highly efficient clarifier for use in trickling filter plants . . . eliminating several non-essentials that multiply construction and operating costs. Upward flow of influent through sludge blanket increases removal of settlable and suspended solids.



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Municipal briefs

• **Many new houses in Memphis**—The 37,500th house to be started in Memphis and Shelby County, Tenn., since Jan. 1, 1946, is now under way. The Home Builders Association of Memphis reports that about 25 percent of the population of the city and county now live in houses not more than six years old.

• **To save Baltimore teeth**—The use of fluosilicic acid at 1 ppm in the water supply of Baltimore, Md., to help reduce tooth decay will begin about April 1, it has been announced by Joseph S. Strohmeyer, city water engineer. Approval has been received from the National Production Authority for the allocation of seven tons of steel for the installation of the fluoridation equipment at the Montebello filtration plant.

• **Baltimore's improvement program**—The Baltimore City Planning Commission has outlined a maximum capital improvement program for the next several years to cost $149,800,000. For the most part, the money needed has been approved by the voters, Chairman Thomas F. Hubbard said. The major expenditures recommended are: Water supply, $34,884,000; public school system, $30,453,500; streets, highways, bridges, $25,023,000; port development, $12,000,000; Bureau of Sewers, $11,012,000; welfare, city hospitals, $7,900,000; redevelopment, $5,000,000; mechanical-electrical services, $4,150,000; parks, recreation, $5,124,135.

• **Cleveland water, light and sewerage**—A $18,700,000 water, light and sewerage improvement program to be put under contract and begun this year has been outlined by Emil J. Crown, director of public utilities. The largest items are a $9-million modernization of the southerly sewage disposal plant and a $5,500,000 water expansion program for western and southwestern suburbs.

• **Detroit relocates 8,000 families**—Relocation plans for more than 8,000 families in Detroit have been approved by the Public Housing Administration. This is a necessary first step in proceeding with the $100 million project of slum clearance believed to be one of the largest public housing projects in the nation.

• **Master plan**—Dayton, Ohio, City Commissioners have informally selected Harland Bartholomew and Associates to develop a "comprehensive plan" for the city, at a cost of $140,000.

Julien Steelman named to head Koehring Co.

Julien R. Steelman, vice president of Koehring Co., Milwaukee, for the past 11 years, was named president by the board of directors on Jan. 22. He succeeds George E. Long, who becomes chairman of the board.

A graduate of Washington State College in 1930 with a B.S. of C.E. degree, Steelman spent four years with the American Bridge Co., followed by two years with the Tennessee Valley Authority before joining the C. S. Johnson Co., Champaign, Ill., in 1936. In 1941, he resigned as president of C. S. Johnson to join the Koehring Co.

J. G. Kassab, vice-president in charge of the Pittsburgh office of Ragnar Benson, Inc., engineers and builders, has been elected a director.

Prof. Radnor J. Paquette, graduate of Michigan College Mining and Technology and formerly at the University of Florida, has joined the Georgia Tech staff as associate professor of civil engineering and head of the course in highway engineering.

G. Brooks Earnest, dean of engineering at Fenn College, Cleveland, Ohio, has been named acting president of the institution to fill the vacancy created last September when President Edward Hodnett resigned to go to Ohio University. The trustees assigned Mr. Earnest the job of selecting his own successor as dean of engineering. A 1927 graduate of Case Institute of Technology, Mr. Earnest served 20 years on its faculty. He is at present a member of the Board of Direction of the American Society of Civil Engineers.

Louis H. Durst, C. Hinman, and C. F. Horton have been named vice-presidents of Brown & Root, Inc., engineers, Houston, Texas.

Philip S. Forsey has been named as the first minister of Canada's new Department of Municipal Government and Supply, which will administer the Slum Clearance Act and all housing matters.

James P. Growden, chief hydraulic engineer for Aluminum Co. of America, has become engineering consultant for ALCOA. **B. J. Fletcher,** formerly assistant, will succeed Mr. Growden.

Ex-Reclamation engineer goes to State Department

The transfer of Wesley R. Nelson, Assistant Commissioner of the Bureau of Reclamation, to the Department of State to accept an assignment with the Technical Co-operation Administration, has been announced by Secretary of the Interior Oscar L. Chapman.

Mr. Nelson grew up "on a ditch" in the irrigated area near Norwood, Col., and attended the University of Colorado and the University of Southern California. He received his degree in civil engineering at the latter school.

He entered the service of the bureau in 1922 as a surveyor and junior engineer on the Grand Valley Project in Grand Junction, Col. Mr. Nelson held a key post in the construction of Hoover Dam, serving as assistant and associate engineer for the first of the great multipurpose structures the bureau built during the last two decades.

In 1936, he became Chief of the Engineering Division of the bureau. He organized and was Director of the Amarillo, Tex., office of the Bureau of Reclamation.

Col. O. A. Seward, Jr., senior resident engineer of the Texas highway department at Groesbeck, has retired after 30 years of service. He is the senior member of Seward & Shurtleff, of Ft. Worth.

J. S. Fluor has been elected president of Fluor Corp., Ltd., taking the job vacated by **D. W. Darnell,** now chairman of the board.

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THAT LEAK
FOR **GOOD**

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(SIKA-KOTE, SIKA TRANSPARENTS) SIKA-KOTE, a protective and decorative coating in 9 colors and white, prevents moisture penetration on concrete and masonry structures. SIKA TRANSPARENTS render brick structures water-repellent and preserve their appearance

● **FOR NON-LEAKING SURFACES**
(SIKACRETE, SIKA-KOTE) Water-resistant SIKACRETE mortar is used wherever cement-coat work is indicated. Economical, easy to apply SIKA-KOTE prevents penetration of ground-moisture.

● **FOR GUNITING OR PRESSURE GROUTING**
(SIGUNIT, SIKA No. 4, PLASTIMENT) For quick work against leaks or in tidal areas, SIGUNIT in mortar prevents washouts. SIKA No. 4 (GROUT-SIKA) accelerates set, increases cohesion of mortar and adhesion of grout to rock.

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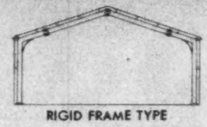
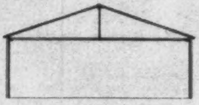


RIGID FRAME TYPE

TRUSS TYPE



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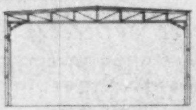

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OBITUARIES

John A. Roebling

John A. Roebling, 84, son of the builder and grandson and namesake of the designer of the Brooklyn Bridge, New York City, died at Bernardsville, N. J., Feb. 2. The son of Washington A. Roebling, he obtained a civil engineering degree at Rensselaer Polytechnic Institute in 1888. Later he did experimental work at the Roebling steel wire and cable factory near Trenton, N. J. for several years.

Mr. Roebling was engaged in many philanthropies, in most of which his name did not appear. He donated his father's large collection of minerals and uncut stones to the Smithsonian Institution in Washington, D. C., and set up a $150,000 endowment fund for it.

Walter P. Berg, 60, vice-president and director of the Dravo Corp. Pittsburgh heavy construction firm, died Feb. 3 in Bellevue, Pa. With Dravo for 30 years, Mr. Berg also was president and director of the Dravo-Doyle Co. and a director of the Tri-Lok Co., Union Barge Line Corp. and Southern Transfer Co. He was graduated from Lehigh University in 1917.

Perry Filkin, 86, former district engineer for the New York State Department of Public Works, died at Speigletown, N. Y., Jan. 23. He retired in 1933 after 36 years with the department. He attended the U. S. Military Academy in the early 1920's. He was district engineer at Albany, Buffalo, Rochester and Binghamton.

Maurice E. Bowlen, 80, one of the builders of the Panama Canal, died in Long Beach, Calif., Jan. 29. From 1905 to 1910 he was superintendent of the bridge and building department of the canal. Earlier he helped build Boston's South Station, the Navy Yard at Charlestown, Mass., and a railroad bridge over the Housatonic River near Derby, Conn.

C. Adrian Sawyer, Jr., 73, president of the Sawyer Construction Co. of Boston, Mass., died at Waban, Mass., Jan. 29. A 1902 graduate of Massachusetts Institute of Technology, he became a member of the M.I.T. Corp. and president of the alumni association. He headed a firm which built many large medical and educational units in Massachusetts.

Wm. H. Oldham, 68, engineer of Lorain County, Ohio, died in Lorain, Jan. 20.

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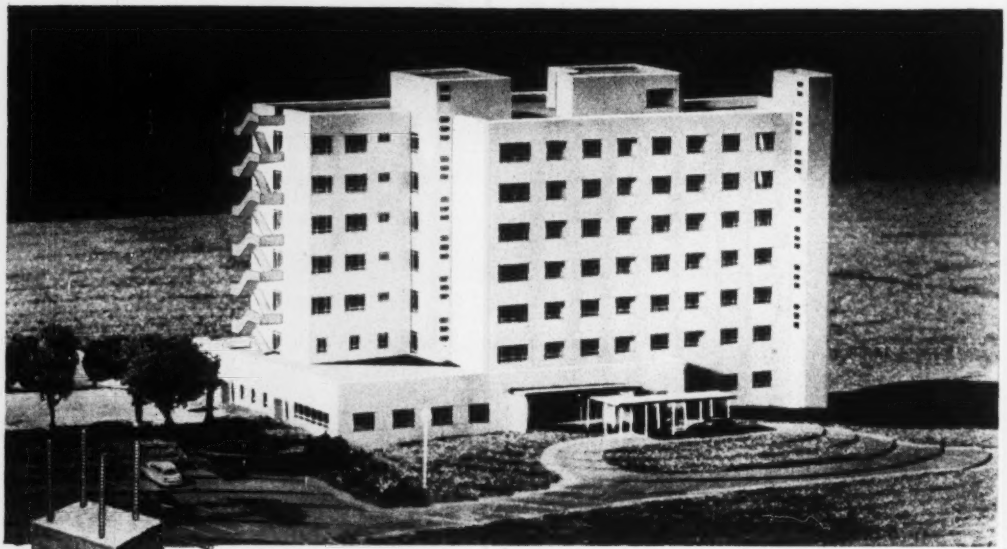

West Contra Costa Hospital-Ceco Reinforcing Bars

How 3 hospitals met material shortages

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In every part of the nation there's need for more and more hospitals today. And with typical western vigor California is doing much about it with an ambitious building program.

One of the problems facing Stone and Mulloy, architects for the structures pictured here, was availability of materials. To solve this problem reinforced concrete skeleton construction was selected. Ceco reinforcing bars were used on all three projects, with Ceco providing complete shop and field erection details. Concrete joist construction was chosen for the floor systems—and here, on two of the projects, Ceco met the need with Ceco Meyer Steelforms.

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Then too, there were further advantages in building the floor systems with the Steelform method: (1) savings in men because less time and labor were required, (2) savings in money because less concrete and lumber were needed, and (3) savings in material because here too, a minimum of steel is necessary.

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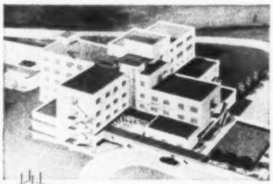
Contractors for these three projects include: Parker, Steffens & Pearce—Williams & Burroughs, Inc.—Carl N. Swenson & Co.—Architects: Stone & Mulloy.

Peninsula Hospital
Ceco Meyer Steelforms
& Reinforcing Bars



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In construction products **CECO ENGINEERING** *makes the big difference*

Equipment distributors cite need for more parts, fewer price rules

Mixed feelings of confidence and doubt assailed the Associated Equipment Distributors as they wound up their 33rd annual meeting in Chicago last week. And it was no wonder.

During their 4-day meeting they had been told that: some lines of heavier construction equipment would continue to be in short supply; the supply of repair parts, already short in many lines, may become shorter; little immediate relief is seen from the restrictive OPS pricing regulations on used construction equipment; and the Corps of Engineers' 1952 equipment repair program by contract with distributors and commercial repair shops will be only one-half of last year's volume.

On the hopeful side of the ledger, however, they learned that: an additional $50 million of new construction is to be purchased this year; replacement and repair parts will be needed for the equipment performing $2.8 million of military construction during 1952; and the dollar volume of construction, maintenance and repair this year will be only slightly less than last year's all-time record.

"From the contractors' point of view," said Walter L. Couse, Detroit, Mich., contractor, "the importance of an adequate supply of repair parts for construction equipment can not be overemphasized."

Speaking for the Associated General Contractors of America, Inc., Couse warned that the repair parts problem threatens to become much more serious during 1952.

The distributors are equally concerned by the spare parts situation. In a resolution, adopted unanimously, they urged the manufacturers to balance production of new machines and spare parts so that equipment in the field can be properly serviced with repair parts and kept in efficient working condition. They also requested the NPA to allot more materials to manufacturers to permit a better balance of parts and new machines.

HARRY J. HUSH, new president of AED.

• **Used equipment prices**—Most controversial topic at the 4-day meeting—which had a registered attendance of 2,608—was pricing regulations on the sale of used construction equipment. This was brought out at a "Washington Roundtable" session headed by representatives of OPS and representatives of the NPA.

The distributors see no necessity whatsoever for any pricing regulations on the sale of used equipment. They contend that the CPR 105—covering the sale of used equipment—is unfair, too restrictive and virtually inoperable on the part of the distributor.

• **Equipment supply**—A slightly better but not too encouraging picture of the equipment supply situation was presented by panel members M. B. Garber and C. J. Haring.

"Military schedules for construction equipment will continue to be heavy this year," said Garber. "Some controls probably will have to be added, but NPA hopes to keep them, as well as the manufacturers' paper work involved, to a minimum.

"Power shovels of ¾-, 1½-, and 2-cu yd capacities will be in heaviest demand by the military," said Haring, "and so will 10- and 20-ton cranes."

The NPA also looks for bituminous pavers to be critically short, as well as rear end dump trucks and class 1 and 2 tractors, said Harding.

What the manufacturers see in the 1952 construction equipment picture was outlined by Julien R. Steelman, newly elected president of Koehring Co., and president of the Construction Industry Manufacturers Association. Briefly, it is this:

"Heavy tractors and medium-sized shovels will be difficult to obtain for civilian buyers," said Steelman, "but

(*Continued on next page*)

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The Vibro-Plus ROLLGEAR vibrator head steps up low shaft speeds to high vibrating speeds —11,000 to 15,000 per minute.

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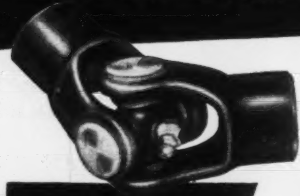

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Meetings . . .

the available supply of small tractors —both crawler and rubber-tired— should be in reasonable close balance with demand.

"As to earth-carrying scrapers," said Steelman. "A few manufacturing companies have very heavy backlogs of government business. Asphalt plants, concrete batching plants and concrete pavers are casualties of the philosophy that roads are expendable.

"Manufacturers of asphalt plants and black-top pavers," declared Steelman, "have experienced the most severe cuts in materials of any of the major categories of compression construction equipment."

• **Small equipment easier**—Paradoxically, however, small equipment may be easier to get throughout this year. This is attributed to the fact that the complexities of the job make it impossible for DPA and NPA to set up controls for all items of manufacture for the construction industry.

What the military will need in the way of construction equipment and replacement parts was presented by Brig. Gen. Arthur W. Pence, Assistant Chief of Engineers in charge of military supply and procurement. He said, "Equipment requirements for the Corps of Engineers procurement program will remain essentially firm at present levels."

• **The military program**—"The military construction program for fiscal year 1952 (ending June 30, 1952) includes $700 million for off-shore construction; and $2.1 billion for construction in this country; mostly for the air force. Of the $2.1 billion, $1.7 billion will be for buildings and structures, and $400 million for construction requiring earthmoving and other heavy equipment.

"A survey made last year indicates there is sufficient equipment on hand for the $2.1 billion program.

"The $700 million off-shore construction program presents a different situation," said Gen. Pence. "The cost of transportation and lack of repair facilities make it desirable to have a maximum of new equipment. The contractors, most of whom work under a cost-plus fixed fee contract, are required to furnish from ten to 20% of their equipment need.

"There is little likelihood that any of this equipment will ever return to this country," said Gen. Pence.

"The military equipment program for fiscal 1952," declared Gen. Pence, "will be about equal to fiscal 1951, when $510 million of new equipment was purchased, and $102 million of spare parts.

"Repair of military construction equipment in this country—which totaled $10 million last year, under 137 private contracts—will be cut in half this year. Cessation of Korean hostilities or accelerated shipments of equipment to the NATO countries, however, might increase this repair program," concluded Gen. Pence.

Harry J. Hush, vice-president of Griffith Equipment Corp., New York City was elected president of AED; succeeding R. L. Arnold, Arnold Machinery Co., Salt Lake City. Other new officers are: S. John Oechsle, Philadelphia, executive vice-president; and vice-presidents, G. W. Gagel, Kansas City, Mo.; Frank Skidmore, Albuquerque; and J. G. C. Morgan, Vancouver, B. C. E. J. Crosby was re-elected treasurer. P. D. Hermann is executive secretary, and J. R. Randle, field secretary.

Bargaining groups to meet in Chicago

Engineers representing a number of independent collective-bargaining groups are to meet at Hotel Morrison, Chicago, Feb. 22-24. Sponsor of the meeting is the National Professional Association of Engineers, Architects and Scientists.

Chief object of the conference is to explore the possibility of bringing more of the unaffiliated groups into the National Professional Association.

Organizations now affiliated with NPA are the Seattle Professional Engineering Employees Association, Southern California Professional Engineers Association, Sacramento Group of Professional Engineering Employees, and the Engineers Guild of Oregon. These all will be represented at the Chicago Conference.

Also present will be representatives of the Council of Western Electric Technical Personnel (Newark, N. J., Baltimore and Chicago); The Engineers Association (Sperry Gyrascope); the Association of Professional Engineering Personnel (RCA at Camden); the Association Engineers and Engineering Assistants (GE at Philadelphia); and the Minneapolis Federation of Honeywell Engineers (Minneapolis-Honeywell). About 25 other organizations have been invited.

Among the subjects to be considered are adoption of a constitution for the NPA that will be somewhat more liberal than the interim constitution under which the organization is now functioning, which limits membership to licensed professional men. A member grade corresponding to the grade of engineer-in-training has been proposed.

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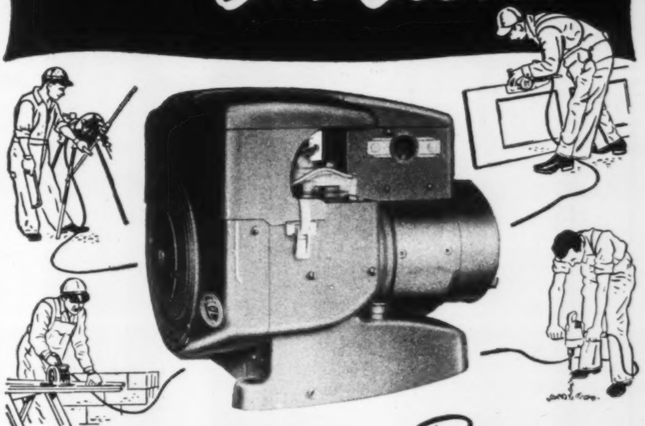
Cut Costs!



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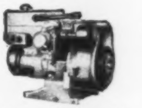

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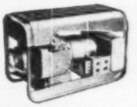
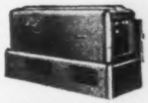


TWO-CYLINDER MODELS—Horizontally-opposed air-cooled. 1,500 and 3,000 watts A.C.— 2,000 and 5,000 watts D.C.



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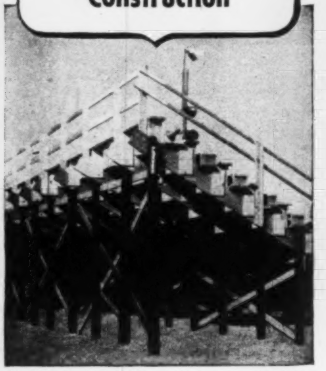

Bleachers supported by Koppers Pressure-Creosoted Poles.

LAST FALL, the high school in Yuma, Colorado, needed more seats for spectators—needed them in a hurry. *Within a few days*, the 90-foot bleachers shown here were built by the local Lions Club.

No Foundations Required

The pole-type method of construction, used in building these bleachers, speeds up and simplifies the erection of many different kinds of structures, from newsprint warehouses to barns. No foundations are required . . . structures are carried by poles that go deeply enough into the ground to provide solid support and strength. Costs can be cut almost in half, yet the completed structures can be just as permanent and practical as the more expensive, conventional type.

Poles Are Important

With this kind of construction work, the *quality* of the poles is important. Koppers Poles are made from sound, strong wood. Pressure-treatment with creosote is deep and thorough, protecting poles against rot and termites. Koppers Poles give decades of good service, making them extremely economical. They require no painting and never rust.

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RUBBER-ASPHALT SPECIMEN—This is a close-up of a rubber-asphalt specimen being put through a Hveem stabilometer test on a high-compression machine. Left background, one of the technicians is running a test on some rubber powder. Right background, the chemist conducts a distillation check on volatile solvents used in rubber road tests. The laboratory will concentrate on rubber road research, but there also will be research in other paving fields.

Rubber road laboratory is making experiments

The promoters of rubber roads have added a new, well-equipped highway-material testing laboratory in their drive to open this new market for rubber. The Natural Rubber Bureau of Washington, D. C., representing the Malayan producers of natural rubber, on Jan. 15 opened their new lab in Rosslyn, Va. Research and testing is under the direction of Harry K. Fisher, consulting engineer who has specialized in highway and airport construction. There is a staff of half a dozen already.

The natural rubber producers, fearing the loss of some markets in the United States to factory-produced synthetic rubber, have been backing a large promotion campaign to sell their product for highway use. Since 1949, the bureau has cooperated in laying down test highway strips composed of varrying mixtures of asphalt and rubber.

Plastic pipe evaluated for water supply systems

The National Sanitation Foundation at the University of Michigan has been engaged by manufacturers of extruded plastic products to start at once on research expected to demonstrate that plastic pipe is not toxic and has the chemical stability necessary for water supply adaptations and similar uses.

The studies, to extend over at least two years, will be in charge of Walter D. Tiedeman, formerly connected with the N. Y. State Department of Health. He will work with an advisory committee of sanitation and public health officers and representatives of the plastics industry.

First tests will be made on 26 samples of pipe made of polystyrene, polyethylene, cellulosic materials, and copolymers of polyvinyl chloride. Answers will be sought to these questions: Do any types of tap water become polluted by contact with the specific types of plastic? If there is erosion in the plastic pipe, will continued ingestion of the eroded plastic cause pathological changes?

A limited quantity of plastic pipe has been manufactured for water system use in recent years and there have been some installations of it, mostly in rural sections. With its expanded use, however, it has come to the special attention of local health officers throughout the country who are raising questions about its suitability because to date no tests of its toxicity and chemical stability, which those officers will consider authoritative, have been made.

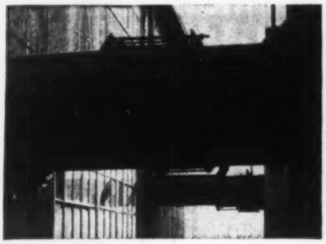
Delays don't go

on Defense construction

Vital construction today must move rapidly. Pipelines have to go in quickly—must be dependable. Dresser Couplings make your fastest, surest pipeline installation—whether it's a temporary line for construction purposes or a permanent line that must serve for years and years.

These factory-made pipe joints require only a wrench to install. Any laborer can do the job and do it right. Dressers make "flexible-tight" joints that remain tight despite vibration and expansion-contraction stresses that would open rigid or caulked lines. Suitable for gas, air, oil, gasoline, water and other lines. Mail the coupon below for information and engineering reports on recent Dresser Coupling installations.

This Dresser-Coupled line supplies gas to a Detroit steel mill . . . dramatically illustrates the rugged service expected and received with Dresser Couplings. Heavy vibration from railroad tracks on both sides and over line, is harmlessly absorbed by Dresser gaskets and the line stays permanently "flexible-tight."



Ability to withstand vibration is important here. Dresser Couplings stay tight on exhaust lines of 2400-h.p. engines at a pumping station in the southwest.

In close quarters, dependable connections are easily made with Dresser Couplings. Many engineers say they are "the only practical pipe joint" in crowded locations.

Dresser Couplings are extremely useful for temporary construction lines. Lines may be disassembled and moved with virtually 100% salvage—especially important in times of shortages.

DRESSER

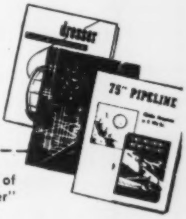
"FLEXIBLE-TIGHT"

COUPLINGS

Dresser Manufacturing Division,
319 Fisher Avenue, Bradford, Pennsylvania
(One of the Dresser Industries)

GET THESE FOLDERS NOW!

Interesting engineering data on varied types of lines installed with Dresser Couplings. This is file material.



Gentlemen: Please send me your "Report of Dresser-Coupled Lines," your "Bridge River" reprint, and "Style 38" Catalog.

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Address________________

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Sound advice about TRUCK POWER

When you're sweating to get a rugged construction job done on schedule, you just can't afford to waste time with an underpowered truck—or one that's ill-fitted to its job.

That's why a Dodge "*Job-Rated*" truck is your best bet. It provides the kind of power that takes its job in stride!

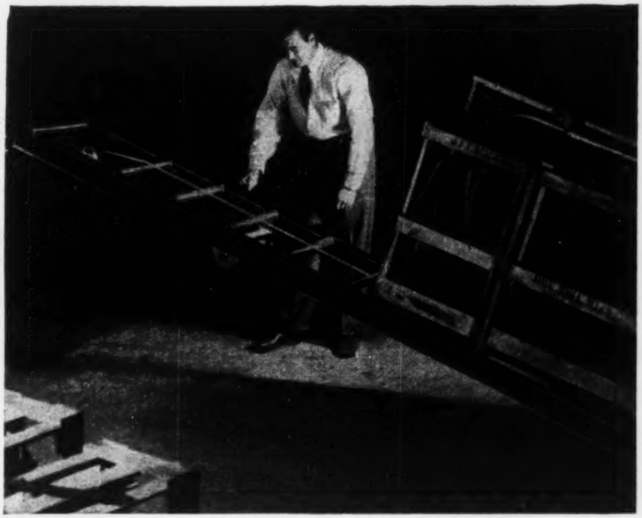
Take a husky Dodge 2¾-ton truck, for instance. With Twin Carburetion and Exhaust System, its sturdy high-compression engine turns out *137 horsepower!*

It's mighty dependable power, too. Scores of up-to-the-minute features result in low-cost operation, long life, and year-'round dependability. Consider, for example, such extra values as stellite-faced, sodium-cooled exhaust valves . . . surface-hardened bearing journals . . . intake valve and exhaust valve seat inserts . . . and others!

Add to all this the fact that there's a Dodge "*Job-Rated*" truck that's factory-engineered to fit your job and your power needs to a "T"!

So . . . why not get a truck that's designed especially to take sweat and strain *out* of your toughest jobs and put extra profits in. Get a Dodge "*Job-Rated*" truck! See your nearby Dodge dealer—*soon.*

DODGE "Job-Rated" TRUCKS



One-man rig makes loading easy

Instead of the normally required two or four men, one man can use the new Belsaw loader to roll items off or on delivery trucks, platforms, etc. Weighing less than 150 lb., the rig handles up to ½-ton loads. An easily-operated two-speed hand winch is attached with an extension handle that permits loading of wide boxes and crates. Originally designed for construction men for loading heavy, bulky items to and from the job, it has proven ideal for many other uses as well. Available in 10-ft and 20-ft lengths from **Belsaw Machinery Company, 315 Westport Road, Kansas City 2, Mo.**

Sonar device developed for underwater work

A sonar device which should be useful in dredging, hydrographic surveys, channel reconnaissance, etc., is now available. Heart of the compact, 150-lb. machine is a crystal of Rochelle salt, which can be ground to control ultrasonic signals at a desired frequency. This crystal converts electrical energy into pulses of ultrasonic sound. The sound is focused into a narrow, searchlight-like beam which has a range of one mile. Sound pulses are shot out through a transmitter, with echoes from underwater objects coming back to the transmitter, displayed on a cathode-type screen. Another cathode-ray tube, which measures distance, also helps to identify the nature and exact position of the target.

The returning echoes are translated into audible sounds which a trained operator, listening to a loud speaker, can easily identify. Solid objects, such as rocks, give a hard, sharp "ping", while a hidden sand bar, for instance, brings a harsh, scratchy sound. **Intervox Corporation, Seattle, Wash.**

Cutting torch uses gasoline as fuel

A new cutting torch has been developed—one that burns gasoline and oxygen—and it is said to have many advantages over the oxyacetylene type. Usable for such operations as cutting, brazing and scarfing, the torch is said to do as much work on 70¢ worth of gasoline as the oxyacetylene torch can do on a 100 cu ft tank of acetylene.

Basically, the new torch operates in the same manner as an acetylene torch. It blends liquid gasoline and oxygen, which is converted into vapor in the torch tip by the heat of the flame. Other advantages claimed are reduction in bulk and weight by elimination of large acetylene cylinders in favor of small gasoline cans, and a cutting head design which eliminates backfiring and backflashing into the torch handle. Manufactured by Browning Torch Corp., it is available from the distributor, **Steel News Industries, Inc., R.D. #2, Canonsburg, Penna.**

(*Continued on next page*)

MONEY-MAKING

CMC

MIXERS

CMC 56-S TWO-YARDER

Specifically designed to facilitate increased Central Plant production on big jobs or in commercial plants. Advanced CMC engineering and features assure FASTER, SMOOTHER, and MORE EFFICIENT operation. Equipped with Timken Bearings throughout. Renewable hardened steel drum liners and hard alloy coated discharge buckets insure extra long life. Hydraulic finger-tip controlled charging and discharging.

CMC 11S and 16S FOUR WHEELERS

End or side discharge. Furnished in optional truck mountings. Compact construction for easy trailing and spotting on job. Timken roller bearing. Machined drum trucks. Improved stabilizers.

CMC 6-S TRAILER

HERE IS THE MOST VERSATILE MIXER ON WHEELS. Superior CMC design assures faster charging. This high-speed, non-tilt unit incorporates all the plus-value features that have made CMC mixers "tops in the field." Write today for latest illustrated catalog and prices.

CONSTRUCTION
MACHINERY
COMPANIES
WATERLOO, IOWA

Concrete arch hangar under construction at St. Hubert, P. Q., showing use of prefabricated falsework. Covering will be concrete shell, supported by reinforced concrete arches.

Prefabricated Falsework

ENGINEERED FOR POUR-AND-MOVE SERVICE

YOU CUT COSTS and speed construction with precision fabricated falsework by Timber Structures, Inc. Construction of the hangar shown above is a case in point.

Falsework was engineered for repetitive use, prefabricated to detail and shipped knocked down to the jobsite, where it was assembled and raised into position for pouring the arches and shell. After the proper hardening interval the forms were lowered and rolled into position for pouring the next section. This process was repeated, using the same falsework assembly for the entire building.

Timber Structures, Inc., with a background of over 20 years in timber design and fabrication, is equipped to handle any job no matter how big. Engineering facilities are available, when desired, to work with your own engineers, or to assume all phases of engineering involved in the falsework.

For further information, see your nearest Timber Structures office, or mail us the coupon for literature on falsework and for booklet, "Engineered Timber Construction".

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Please send literature on prefabricated falsework and booklet, "Engineered Timber Construction"

Name______________________________

Company______________________________

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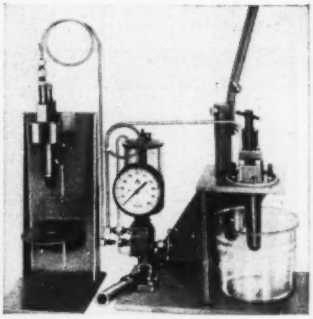
New products . . .



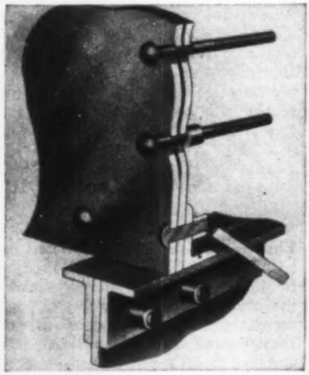
Testing equipment for diesel injection units

This company's line of nozzle injector testing equipment has been expanded to include several sets suitable for testing injection units of medium and large bore and stroke diesel engines. The combination set illustrated here is one of these new nozzle and injector testing devices for heavy-duty diesel power. It comprises a test pump and suitable fuel line connectors.

The nozzles and injectors which can be tested with this combination set include, among others, Electro-Motive 567 and 201A injectors, GM 278 and 278A injectors, American Bosch T, U and V size nozzles. Also Type AKA, AKB and AKK nozzle holders, as well as many others. Bacharach Industrial Equipment Instrument Company, 7000 Bennett Street, Pittsburgh 8, Pa.

Circular Blade Saw

In general, it has been learned that fewer teeth, combined with a heavier, more stable blade, will result in a smoother cutting job with less power expenditure. This saw is sturdier, easier to maintain, with super-efficient cutting points. The reduction in number of teeth which lowers the work load on the rim also corrects any tendency of a saw to go "wild" at high speeds. The foregoing are conclusions arrived at after years of development and research and were part of a speech delivered to a meeting of the ASME recently. Labeled the "Bye tooth" saw in honor of Norman G. Bye, director of engineering for the 111-year-old saw manufacturer, it was manufactured only after studies had been conducted to determine the performance of different cutting points and to maintain this performance over longer periods of operation. Further studies investigated the effect of chip thickness, the speed of fiber severance, and the angle of contact. The saw shown above is the result. It is being made with different types of arbor holes so that they may be used in conjunction with any of the standard makes of portable electric saws on the market. HENRY DISSTON & SONS, INC., PHILADELPHIA, PA.



Lock bolts

A manufacturer of a broad line of blind rivets and structural fasteners has announced the recent addition of Lock Bolts. These are high strength, two-piece fasteners, consisting of a pin and a collar. The pin is inserted in the work from one side, and the collar from the opposite side. A pneumatic tool engages serrated grooves in the shank of the pin. Exerting a pulling action on the pin, the tool simultaneously pushes the collar against its material, clamping the material tightly together. Tool swages collar into pin grooves, breaking the pin flush with the collar. The manufacturer says that when these bolts are installed they weigh only 50 percent of an equivalent sized bolt and nut. Strength values are equal or greater than same-sized AN bolts. Diameters range from $\frac{3}{16}$ to $\frac{3}{8}$ in., grip lengths from $\frac{1}{8}$ to $1\frac{15}{16}$ in. HIXSON & JORGENSEN, INC., 600 ST. PAUL AVE., LOS ANGELES 17, CALIF.

When You Call For Any Industrial Requirement In Piping

ALBERT "Rings the Bell"

SPEEDLAY PIPE SYSTEM—completely packaged for fast-laying temporary and semi-permanent lines for water, compressed air and other services.

PILING—Sheet Piling—light weight • Tubular—all sizes

PILE SHELLS—Spiral Welded, Hel-Cor, Riveted, CAISSONS

PILE FITTINGS—All types and sizes for steel and wood, cast steel and iron points. Plates and shoes cast steel and malleable iron sleeves.

CULVERTS—Corrugated, Spiral or Riveted Steel.

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Acker Soil Sampling Kit gives you accurate sub-surface information *Quickly— Easily— Inexpensively*

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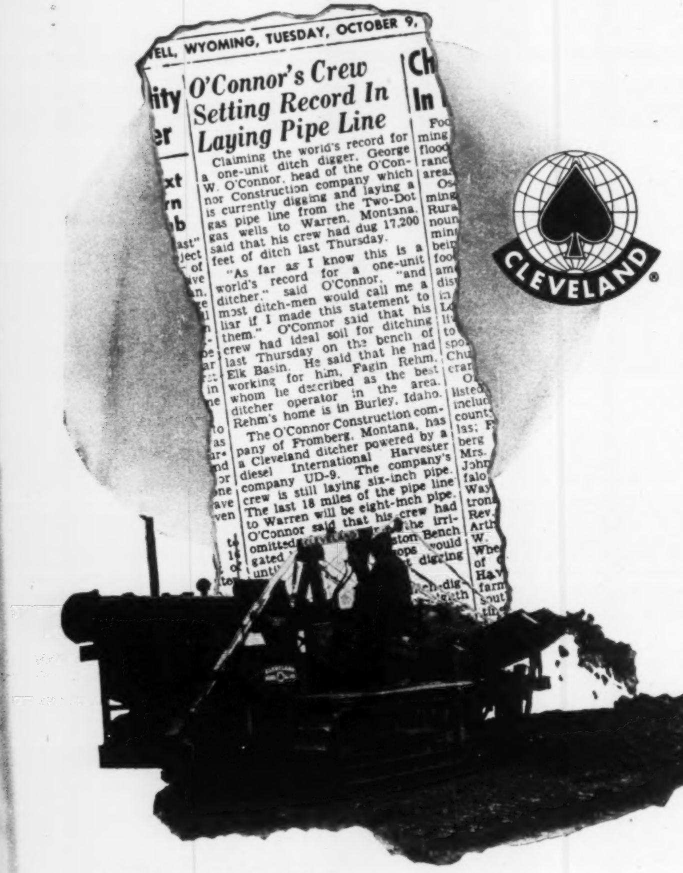
ACKER DRILL CO., INC., SCRANTON 3, PA.

Over 30 years of experience in the manufacture and development of drilling equipment



ELL, WYOMING, TUESDAY, OCTOBER 9,

O'Connor's Crew Setting Record In Laying Pipe Line

Claiming the world's record for a one-unit ditch digger, George W. O'Connor, head of the O'Connor Construction company which is currently digging and laying a gas pipe line from the Two-Dot gas wells to Warren, Montana, said that his crew had dug 17,200 feet of ditch last Thursday.

"As far as I know this is a world's record for a one-unit ditcher," said O'Connor, "and most ditch-men would call me a liar if I made this statement to them." O'Connor said that his crew had ideal soil for ditching last Thursday on the bench of Elk Basin. He said that he had working for him, Fagin Rehm, whom he described as the best ditcher operator in the area. Rehm's home is in Burley, Idaho.

The O'Connor Construction company of Fromberg, Montana, has a Cleveland ditcher powered by a diesel International Harvester company UD-9. The company's crew is still laying six-inch pipe. The last 18 miles of the pipe line to Warren will be eight-inch pipe. O'Connor said that his crew had [illegible]

CLEVELAND

GEORGE O'CONNOR'S

CLEVELAND DUG 17,200 FEET OF TRENCH IN 9 HOURS

Even under ideal conditions 3¼ miles of 22" x 40" trench in one day is pretty fair digging for a single trencher. Naturally, CLEVELANDS don't set records like this every day. But even when they are digging only 200 feet per day under adverse soil and project conditions you can be sure that CLEVELANDS are performing just as profitably as George O'Connor's did for him. CLEVELAND's wide range of transmission-controlled *combinations of digging wheel and crawler speeds* give you the right speed for every job—just one of the many features which make CLEVELANDS preferred by men who base their judgment on *proved performance.*

See your local distributor. Get the full story on these CLEVELAND features:

√ DEPENDABILITY √ EASE OF OPERATION
√ UNIT-TYPE CONSTRUCTION √ VERSATILITY √ BALANCE
√ WIDE SPEED RANGE √ MANEUVERABILITY

THE CLEVELAND TRENCHER CO.
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

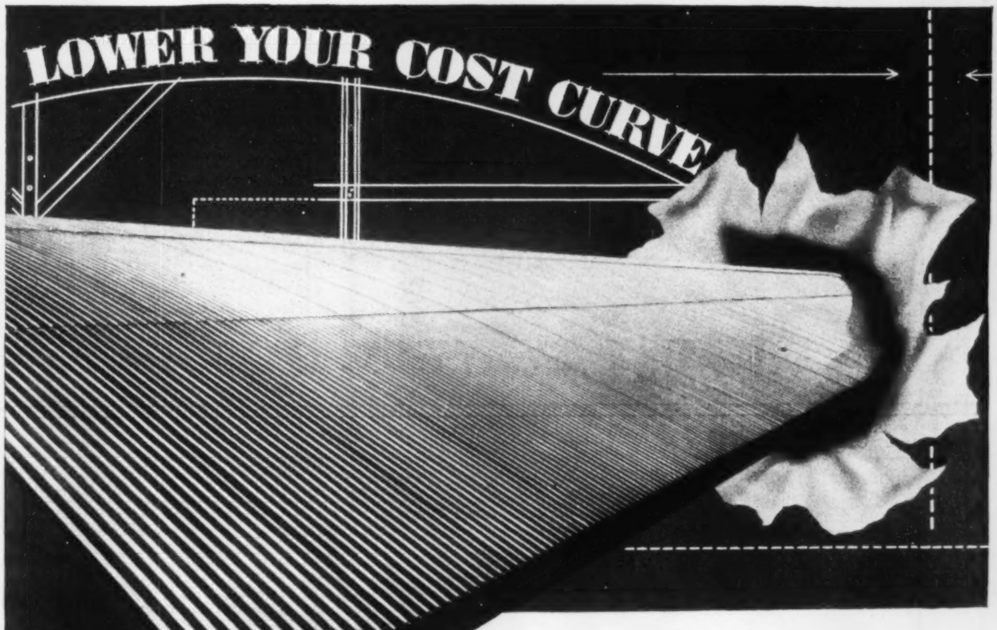
MANUFACTURERS' PUBLICATIONS

"This Is International Steel" is the title of a new book recently released which is said to answer the problems construction men often face of where they can find certain building products and who can fabricate special jobs for them—it gives the builder a quick but accurate picture of what the company can do for him. Included are photographs and descriptions of many jobs where International has overcome obstacles that seemed insurmountable. The 44-page "catalog of sources" acquaints the customer with all the company's various products. INTERNATIONAL STEEL COMPANY, EVANSVILLE, INDIANA.

Metric equivalents—As a special service to the engineering trade this company has compiled a combination Conversion and Decimal Equivalent chart. The chart converts inches to feet and metric equivalents, all on one side. On the other side of this large chart are the standard decimal equivalents. Protected with tin at both top and bottom and ready for hanging, the 17x22 in. chart "S" is available from THE FREDERICK POST COMPANY, 3650 N. AVONDALE AVENUE, CHICAGO 18, ILLINOIS.

Phillie Gear—A 4-page illustrated bulletin entitled "Power-thrifty Products by Phillie Gear" is offered, showing the company's complete line of gears, speed reducers, flexible couplings and Limi-Torque valve controls. All types and size ranges are given and the booklet is highly illustrated with the company's products. PHILADELPHIA GEAR WORKS, INC., ERIE AVENUE AND G STREET, PHILADELPHIA 34, PA.

Tubing failure—The many factors affecting tube life in high-pressure, high-temperature applications are presented in the new 40-page illustrated booklet. Known as booklet TR 516, it presents the results of a great number of investigations of failures of carbon steel, intermediate chromium-molybdenum alloy steel and stainless steel tubing in boilers, cracking stills, heaters and heat exchangers during service at elevated temperatures and pressures in the power, oil and chemical processing fields. The booklet displays the history and experience behind the contemporary development of high-temperature tubing and will be of assistance to those in the field to obtain optimum failure-free service from their tubing installations. THE TUBULAR PRODUCTS DIVISION, BABCOCK & WILCOX COMPANY, BEAVER FALLS, PA.

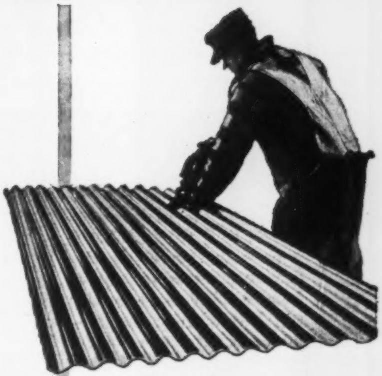


When S. M. Pistorio, of Arbutus, Md., needed a new roof on the curved wood trusses of his big warehouse, he found he could save on initial cost and lower his cost curve through the years with Reynolds *Lifetime* Aluminum Industrial Corrugated.

In this case, 11-foot sheets were used, curved at the site. For other curved roofs, Reynolds can supply curved sheets on request—minimum radius 5′. However, this special use only serves to demonstrate the versatility of aluminum industrial corrugated. On any type of roof it gives the owner the advantages of freedom from rust without protective painting, plus the radiant heat reflectivity that keeps interiors cooler in summer, warmer in winter.

The lighter weight of this roof (56 pounds per square) was especially important on this wood-trussed warehouse. On new buildings this factor can mean substantial savings on framing.

Call Reynolds for technical assistance and application details . . . offices in principal cities. For literature, write to Reynolds Metals Company, Building Products Division, 2007 South Ninth Street, Louisville 1, Kentucky.



Specifications:

- Thickness .032″
- Corrugations 7/8″ deep, 2-2/3″ crown to crown
- Uniform load support (roof) 80 p.s.f. on 4′ purlin spacing
- Uniform wind load capacity (siding) 20 p.s.f. on girt spacing up to 7′9″
- Roofing width 35″, coverage 32″
- Lengths 5′, 6′, 7′, 8′, 9′, 10′, 11′, 12′

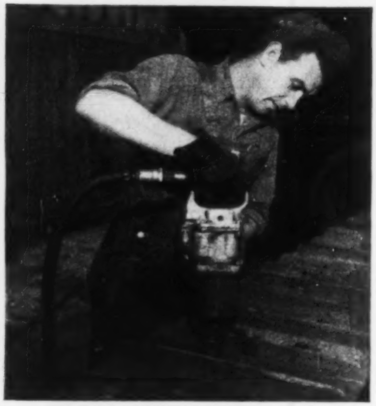
REYNOLDS ALUMINUM

Military demands for aluminum reduce supply, but Reynolds is rapidly expanding aluminum capacity. Rated orders receive priority handling.

REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

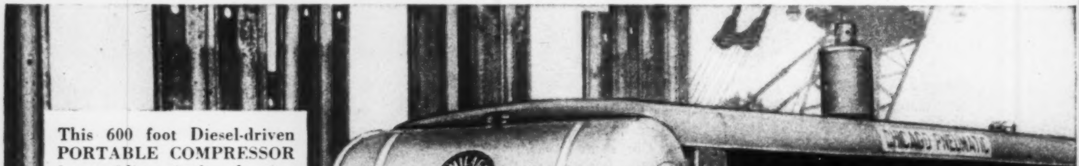
"The Kate Smith Evening Hour" on Television, Wednesdays—Tallulah Bankhead in "The Big Show" on Radio, Sundays—NBC NETWORKS

Nuts to 1¼" bolt size are quickly run off — and on — with this heavy-duty CP-365 AIR IMPACT WRENCH — a big time-saver in erection of structural members and maintenance of heavy equipment.



No job is too tough for the heavy-hitting CP-117 DEMOLITION TOOL, designed for breaking dense concrete and other extremely hard materials. In the world's largest line of demolition equipment there is a CP tool for every type of demolition work. Five models range from the lightweight CP-111 (25 lb. class) to the heavy-duty CP-117 (80 lb. class).

get the job



This 600 foot Diesel-driven PORTABLE COMPRESSOR is providing air for sheeting driving. Ranging in capacity from 60 to 600 cfm — gasoline and Diesel-driven models — there is a CP Compressor for any air requirement. Gradual speed regulator, adapting engine speed to air demands, assures economical operation and minimizes maintenance.

Seven different models of CP PNEUMATIC and ELECTRIC VIBRATORS enable the contractor to select the proper model for any specific job. Two-man vibrators speed the heaviest mass concrete placement. For reinforced walls, columns, floors, and similar work, there are small diameter pneumatic and electric models for one-man operation.

done in fewer hours

This TRIPLEX TAMPER — three CP pneumatic backfill tamper power units on a Gunderson-Taylor mounting — has 75 square inches of compaction area and enables one man to do the work of five individually operated tampers. Greater thickness of fill can be compacted to specifications; lifts can be increased as much as 20%; compactness is more uniform.

Write for
full
information

CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

HERE IS ONE APPLICATION OF SYNTRON "Vibra-Flow" FEEDERS IN A COAL PLANT

Syntron F-45 Feeder units, mounted on 15 degree down slope, handling 40 tons per hour of minus ¼ x 28 mesh, 30% moisture coal to Carpenter Driers. The efficiency of the driers was materially increased by the use of Syntron Feeders.

Fill Your Need For Heavy Tonnage Coal Handling to

Crushers, Screens, Conveyor Belts, Driers, Mullers etc. with

SYNTRON

"Vibra-Flow"

VIBRATORY FEEDERS

Capacities of up to Hundreds of Tons Per Hour At Instantly Controllable Rates Of Material Flow

Finger-tip dial control of rate of flow is standard on all models.

Write Today For FREE Catalog Folder SYNTRON VIBRATORY FEEDERS

SYNTRON
VIBRATORY FEEDERS

SYNTRON CO.

328 Lexington Ave. Homer City, Pa.

More high wages revealed by AEC hearing in Nevada

Additional disclosures were made at the hearings held by a dispute panel of the Atomic Energy Commission on charges of "fantastically" high wages paid at a Nevada test site project. (ENR Feb. 7 p.69.)

It was revealed that a wire splicer received $775.50 for a week when he was credited with 129½ hours. Haddock-Engineers, Ltd., was accused of paying $100 a day for roofers, and paying some workers $500 to $600 a week. Two electrical foremen made over $700 in the week ending Oct. 16, 1951.

In defense of the wage policy during this period a witness testified that the new proving ground control building had to be ready for a bomb firing by Fall, 1951, and that the first contractor—McNeil Contracting Co.—was not going fast enough. The unusual situation justified the cost-plus contract let to Haddock, with their subsequent high-wage policy, to rush the project to completion on time, it was said.

Witnesses said that Las Vegas, Nev., industrial activity was almost paralyzed, as workers left their jobs for the higher wages.

Claims court disallows extra for alteration

The U. S. Court of Claims disallowed a claim by the F. J. Kerchhof Const. Co., of Denver, and six subcontractors for $22,392 extra on an alteration they performed at the Denver mint in 1946.

In 1946 the Wage Adjustment Board ordered wage increases on nonfederal construction projects, and the contractors claimed that they could not keep their men without meeting these wage increases.

The court pointed out that the contract forbade any increase in the contract price due to payment of wages in excess of the rates listed in the contract documents.

Safety record claimed at Savannah River project

Construction workers at the Savannah River, S. Car., H-bomb project have rung up 5 million accident-free hours, and now claim a world's safety record for the construction industry. The previous record was 4,428,629 continuous hours without a personal injury.

The project is being built by E. I. du Pont De Nemours Co., and approximately 25,000 workers are employed by the company and its subcontractors. The former record was also claimed by the du Pont Co.

Union, employer must pay unfairly-fired laborer

Schweiger Construction Co. and AFL Hodcarriers' Union Local 264, of Kansas City, Mo., share the penalty under a recent ruling of the National Labor Relations Board. The board ordered them to reimburse a laborer for wages lost when the construction firm yielded to the union's demand for closed shop conditions.

The construction company was altering a retail store building, and a union steward insisted that the laborer, already employed, get a work permit from the union. When he could not obtain a permit because union members were available for work, a foreman hired a union man in his place.

The NLRB held that this action violated the anti-closed shop provisions of the Taft-Hartley act. The contractor claimed that it was not responsible for the acts of its foreman. The NLRB rejected this claim.

Labor briefs . . .

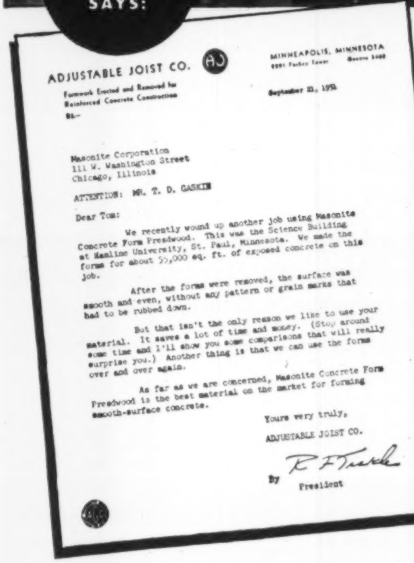
- **Award for injuries**—William L. Olsen, field engineer for Merritt, Chapman & Scott, prime contractor for Garden Apartments project at Clinton, Tenn., was awarded $100,000 damages by an Anderson County Circuit Court jury for injuries he received on the job. The damages were charged against the Bridges Paving Co., a subcontractor.

- **AFL painters strike in N. C.**—Work on DuPont's $40 million textile plant at Kinston, N. C., was halted when members of AFL painters' union struck over wages.

Correction—Latest information concerning the increase in isolation pay for workers at the Hanford, Wash., atomic project (ENR Feb. 7, p.70) supersedes the figures then given. The WSB, following the recommendations of the Construction Industry Stabilization Commission, which roughly reflected the percentage increase in wage rates freely negotiated since 1947, raised the pay 62½¢ per day. Workers living within the barricade will now get $2.12½ a day and workers living outside will get $2.62½.

Concrete Evidence

HERE'S WHAT THE CONTRACTOR SAYS:



ADJUSTABLE JOIST CO.
Formwork Erected and Removed for Reinforced Concrete Construction
RL-

MINNEAPOLIS, MINNESOTA
[illegible] Foshay Tower [illegible]

September [illegible]

Masonite Corporation
111 W. Washington Street
Chicago, Illinois

ATTENTION: MR. T. D. GASKIN

Dear Tom:

We recently wound up another job using Masonite Concrete Form Presdwood. This was the Science Building at Hamline University, St. Paul, Minnesota. We made the forms for about 55,000 sq. ft. of exposed concrete on this job.

After the forms were removed, the surface was smooth and even, without any pattern or grain marks that had to be rubbed down.

But that isn't the only reason we like to use your material. It saves a lot of time and money. (Stop around some time and I'll show you some comparisons that will really surprise you.) Another thing is that we can use the forms over and over again.

As far as we are concerned, Masonite Concrete Form Presdwood is the best material on the market for forming smooth-surface concrete.

Yours very truly,

ADJUSTABLE JOIST CO.

By
President

Hamline University Science Building, St. Paul, Minn. Architects: Holabird & Root & Burgee. General Contractor: George J. Grant Construction Co. Sub-Contractor: Adjustable Joist Co., Inc.

No "after work" when you use Masonite Concrete Form Presdwood

How much could *you* save if you didn't have to "rub down" the surface of concrete after pulling the forms?

You do away with such costly, time-consuming steps when you pour into forms of Masonite Concrete Form Presdwood®. It has no grain, no pattern . . . just a super-smooth, perfectly flat surface that leaves concrete ready to paint.

This is only one of many reasons why experienced contractors are using this low-cost form material. You get all these other advantages, too:

- **Insures complete, uniform hydration. Absorbs practically no moisture.**
- **Saves form lumber costs. Needs no dressed and matched material.**
- **Easy to cut and fit with ordinary tools. Minimum waste.**
- **Can be curved for arches, columns, vaults, etc.**
- **Can be used again and again. Some contractors report more than twenty applications. High percentage of salvage.**
- **Won't split, splinter or crack. Won't flake or separate.**
- **Large 4 x 12-ft. panels are accurately cut. Cover large areas fast with minimum number of joints.**

Interested? Get the complete story of this time and money-saving form material. Fill out and mail the coupon today.

MASONITE® CORPORATION
BOX 777, CHICAGO 90, ILLINOIS

"Masonite" signifies that Masonite Corporation is the source of the product

MASONITE CORPORATION, Dept. ENR-214
Box 777, Chicago 90, Illinois
Please send me your illustrated manual on Masonite Concrete Form Presdwood.
Name..
Firm..
Address...
City and Zone......................State...........

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drawing pencil of the Masters

EXCLUSIVE, Yes!

191 years of priceless experience go into the making of the world's finest drawing pencil.

EXPENSIVE, No!

Ordinary drawing pencils and refill lead have gone up so much in price that CASTELL stands out as an extraordinary value. Now you can use the premium pencil—the world's best—at no extra cost. Order from your Dealer today.

Sharper, clearer and more blue-prints from CASTELL tracings.

U.S.A. A.W.FABER CASTELL 9000 HB
A.W.FABER CASTELL LOCKTITE U.S.A. 2H
CASTELL DRAWING RETOUCHING REFILL LEAD
IMPORTED FROM AMERICAN ZONE * 1 DOZEN 9030 2H

LOCKTITE

The original push button holder with bulldog lead grip.

CASTELL the drawing pencil with the Master Degrees

A.W. FABER-CASTELL

PENCIL COMPANY, INC., NEWARK, N. J.

UNIT PRICES BID BY CONTRACTORS

Alcova Power Plant, Wyo.

The A. C. Horner Construction Co. contract for the Alcova Power Plant and Appurtenant Works for $2,324,224.35 was 13% below the engineer's estimate of $2,670,009.35. It was the low of seven bids submitted to the Bureau of Reclamation Office in Casper, Wyoming, November 28, 1951, and was 53% below the high bid. L. N. McClellan is chief engineer, W. E. Bloomgren is acting chief engineer, Denver, Col.

Part of the Kendrick Project, the new power plant is situated immediately downstream from Alcova Dam, 30 miles south west of Casper, Wyoming. The job entails the excavation and construction for the power plant building, penstock, wye branch, tailrace and septic tank, switchyard cable trenches, tunnel duct banks and surfacing for switchyard, parking, and transformer areas. The contractor must also install plumbing fixtures, heating, ventilation, miscellaneous hydraulic equipment, electrical equipment, and power plant and switchyard grounding which the Government will supply. The Contractor furnished all other material and equipment except where noted install only.

The completion schedule and liquidated damages for various sections of the job are: erecting steel framing for 125-ton crane, power plant superstructure walls, windows, roofing and completing floor area, 705 days, $300/day; installing non-embedded turbine parts including main bearing, unit 1, 735 days, $300/day; unit 2, 795 days, $200/day; all work to generate power, light operating areas and transmit power from unit to and through switchyard, unit 1, 855 days, $300/days; unit 2, 915 days, $200/days; remainder of work, 960 days, $100/day. Minimum wage rates range from $1.45-1.55 per hour for common labor to $1.90-3.00 per hour for skilled labor.

Bidders include:

1C	A. C. Horner Constr. Co., Denver	$2,324,224 35
2	Carl M. Halvorson, Inc., Portland, Ore.	2,649,713 95
7	Grafe-Callahan Constr. Co., Dallas	5,056,777 65

Bids: 11-28-51 Items	Unit	Quantity	Unit prices 1C	2
Prot of work & unwtr fndn	ls	1	$50,000	$100,000
Exc, common, open cut	cy	48,500	2 15	1 50
Backfill	cy	8,550	0 40	0 50
Exc, rock, open cut	cy	13,800	2 15	4 00
Compacting bkfl	cy	1,870	3 50	2 00
Sand bkfl, nonmet cond	cy	20	4 50	5 00
Gravel bkfl	cy	20	7 50	10 00
Pl rockfill behind tailrace training walls	cy	5,400	2 00	1 00
Riprap	cy	250	3 25	5 00
Selected gravel surfacing	cy	180	2 70	0 50
Gr gravel surfacing	cy	80	4 40	0 75
Exc conc in exist tun lining				
2" & less in depth	sf	1,000	3 00	2 00
more than 2" in depth	cy	25	50 00	50 00
Remov of existing conc	cy	1,800	10 00	8 00
F&i 10" drain pipe	lf	900	3.00	4 00
F&i 4" VC s pi., cl jts	lf	400	0.65	1.50
4" f dr tile, open jts	lf	180	1.35	2.75
Drill grt holes not more than 35 ft in depth	lf	4,200	4 00	4 00
F&p std black pipe & fittings for tun grtg	lb	2,100	1 00	1 50
Pressure grouting	cf	5,000	3 00	4 25
Pr grtg with packers	cf	2,500	3 50	5 00
Dr holes for anch bars & grnd rods & grtg in place	lf	630	1 40	1 00
F&h cement	bbl	24,400	6 10	6 50
F&p reinf bars, 1/2" & less	lb	100,000	0 14	0 145
5/8" to 7/8"	lb	430,000	0.135	0 14
1" & larger	lb	1,700,000	0 125	0 135
1st-stg conc, p p substr	cy	4,000	30 00	50 00
intermediate struct	cy	3,200	49 00	60 50
superstructure	cy	150	106 00	138 00
2nd-stg conc p pt str	cy	2,800	20 00	25 00
Conc in blockouts	cy	50	160 00	200 00
switchyd & transf ar fnd	cy	280	38 50	55 00
cable trenches & tun	cy	130	75 00	100 00
penstock tunnel	cy	1,740	37 00	58 00
penstock anchor block	cy	1,710	20 00	20 00
tailrace train walls	cy	500	52 00	54 25
flr lining of tailrace chan	cy	150	20.00	31 00
gutter	cy	20	74 00	150 00
Constr control jts	lf	100	3 00	2 50
F&p 1" corkboard jt fill	sf	900	0 50	3 00
Install rubber wtr stops	lf	2,700	1 00	1 50
rubber joint strips	lf	400	0.75	1.00
F&p 1/2" pref bit-fib jnt fill	sf	105	1 00	1 50
F&i roof deck & roofing	sf	9,900	1 50	1 80
F&p membrane wtrproof	sf	1,100	0 90	0 50
F&a 2-ct asph-emul dmpprf	sy	34	1 50	1 00
F&i stl swinging doors	sf	252	16 00	15 00
stl rolling doors	sf	352	6.00	5 00
met-clad fire doors	sf	83	9 00	17 00
steel windows	sf	3,712	4 80	1 35
Bonded conc fin, flrs & land	sy	1,320	7 00	5 50
Conc wall bases	lf	64	2 50	2 50
F&i rubber tile	sf	1,010	1 00	1 20
rubber cove base	lf	180	0 30	1 00
F&i attached acoustical-unit ceilings	sf	1,200	1.30	0.75
Paint 3 oil-circ brkrs, 3 pot transf, 4 coupl capac, & 3 carrier current tuning cab	ls	1	700.00	1,000
F&e str stl bldg framing for p pl sprstr.	lb	640,000	0.22	0 215
F&e either stl-panel or non met panel side walls	sf	14,800	2 20	3 25
F&e switchyd & transf area stl structure	lb	146 000	0.35	0 40
F&i stub angles & bus poles	lb	2,700	0.70	0 40
pipe tie downs, anchor bolts, anchor assemb	lb	3,200	0.75	1 00
F&e transformer area chain-link fence	lf	270	11 00	12 00
F&i embedded met frame	lb	6,000	0 60	0 60
stl hatch cov, manhole cov, cov plts, flr plts, gra	lb	70,600	0 40	0 30
F&i met railings	lb	6,400	0 85	1 00
Furn anchor bolts	lb	15,000	0 55	0 70
Install anchor bolts	lb	32,000	0.25	0 20
F&i met toilet-stall partitions	lf	130	32.00	4 00
Install metwk for cable trays & power cable suppts in p p & cable tun	lb	6,000	0 30	0 20
cmt-asb shts for cable trays in power plant	lf	900	1 00	1 00
F&i met safety treads	lf	400	2 40	2 50
track rails on conc	lb	10,400	0 20	0 25
timber ties	Mfbm	8	350 00	300 00
guard timbers	Mfbm	1	500 00	400 00
tr rls on timb ties	lb	10,700	0 16	0 45
F&p rock ballast	cy	3,300	3.70	0 75
F&i misc met work	lb	16,000	0 50	0 75
Rem stairs, railing & str stl	lb	8,800	0 12	0 20
F&i penstock	lb	900,000	0 32	0 43
Install drft-tube blk-hd gts	lb	36,600	0 13	0 10
seats & guides for draft-tube blkhead gt	lb	22,000	0 11	0 15
butterfly valves	lb	320,000	0 12	0 05
Rem 84" needle valves	lb	260,000	0 04	0 05
Install crane & hoists	lb	225,000	0 05	0 05
oil storage tanks	lb	34,000	0 04	0 05
two 26,500 hp hydraul turbines	ls	1	67,000	30,000
two 182,000 ft-lb gov for hyd turbines	ls	1	4,700	5,000
motor-driven dr & unwtrg pumps in p p	lb	7,000	0 10	0.10
motor-driven gear-type oil pumping units	lb	800	0.17	0 20
two 100 lb/si, motor-driven air comp	lb	10,750	0 09	0 10
one 350 lb/si, mot-dr port air comp	lb	1,200	0 14	0 10
after-coolers	lb	750	0 18	0 10
air receivers	lb	4,000	0 09	0 10
misc ind inst m	ea	18	25 00	30 00
water-level instr	ls	1	200 00	400 00
CO. fire-ext sys for gen	ls	1	2,500	2,500
for oil-pur & oil-stor rm.	ls	1	800.00	2,500
port fire ext, hose reels & cart in p p	ls	1	1,000	500 00
fire-hose cabinets	ea	5	25 00	40 00
air & wtr serv cabnts	ea	5	25 00	50 00
port oil pur & filt-paper dry oven	lb	5,000	0.15	0 10
name plates	ea	250	2.50	3 00
spec valv & ftgs in p p	lb	3,000	0.60	0 25
flang strnrs in p p	lb	2,500	0.50	0.10

(Continued on page 184)

NEW
THE WORLD'S BIGGEST LOADING SHOVEL
MARION 191-M
10 cubic yards
MARION
MARION 191-M

Loads trucks in the 50-ton class in 3 or 4 passes to meet big haulage problems.

Big enough to load gondola rail cars quickly.

Greater travel speed and maneuverability than most of smaller machines.

All - electric or diesel electric power; Ward-Leonard control on both.

A 10 cu. yd. heavy-duty shovel with small-machine cycle time.

Largest two-belt crawler shovel built.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.
OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

from 3/4 cu. yd.
to 45 cu. yds.

CEMENT GUN COMPANY RESTORES HYDRO-ELECTRIC PLANT WITH "GUNITE"

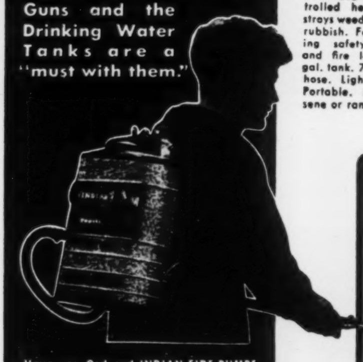
Extreme weathering and vibration had cracked and eroded the mortar joints of this brick power station in Wisconsin, causing a hazardous condition from leakage. Due to the vibration, reinforced "GUNITE" was specified for its resistance to cracking and crumbling. We applied approximately 1½" mesh reinforced "GUNITE" to restore the building, eliminate danger from moisture and strengthen the walls. Lower photo shows finished appearance of the building.

This job, and many other types of "GUNITE" jobs done by us, are illustrated and described for you in our 64 page Bulletin (A) 2400. For more information, perhaps closer to your own needs, write for free copy. We'll be glad to cooperate with you in solving your construction problems.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA U.S.A.
MANUFACTURERS OF THE CEMENT GUN

STOP FIRES FAST with INDIAN FIRE PUMPS

Protect property, guard lives with these famous back-pack extinguishers. Contractors and construction engineers find them very necessary in their outdoor work. The Flame Guns and the Drinking Water Tanks are a "must with them."



FLAME GUN SPRAYER

HUNDREDS OF USES

2000 degrees controlled heat. Destroys weeds, brush, rubbish. For burning safety strips and fire lanes. 4 gal. tank. 7 ft. oil proof hose. Light. Compact. Portable. Burns kerosene or range oil.

Smith INDIAN
Drinking Water & Supply Tank

For carrying drinking water to fire fighting crews, and refilling Indian Fire Pumps. 5-gal. cap. Push button faucet. Carries by handle or slung on back.

Have you Ordered INDIAN FIRE PUMPS for Civil Defense? Be prepared!

Send for Full Details on INDIAN FIRE PUMPS and our Complete Line of Sprayers

D. B. SMITH & CO. 432 MAIN ST. • UTICA 2, N.Y.
"Originators of Sprayers Since 1888"

(Continued from page 182)

Bids: 11-28-51			Unit prices	
Items	Unit	Quantity	1C	2
F&i outlet-wks piping	ls	1	10,000	13,300
C I soil pipe & ftgs	lb	23,000	0.23	0.40
C I b & s wtr p & ftgs	lb	58,000	0.20	0.32
met tubing, pipe, valv & ftgs, 2" & under, exc soil & wtr p & f	lb	19,300	0.30	0.50
exposed met pipe, valv & ftgs, 2 1/2" & over exc CI s & w p & f	lb	50,000	0.30	0.35
pipe hangers & suppt	lb	3,000	0.30	0.50
Instl drink wtr cooler	ea	1	30.00	75.00
F&i water closets	ea	3	150.00	250.00
urinal	ea	1	115.00	200.00
lavatories	ea	3	60.00	250.00
service sink	ea	1	90.00	300.00
elec stor wtr heatr	ea	1	125.00	300.00
heat & vent syst	ls	1	49,000	55,000
grounding sys in p p, switchyd & transf area	lb	6,000	1.75	1.40
F&L embedded elec rigid met cond, 1/2"	lf	250	0.55	0.60
3/4"	lf	6,500	0.70	0.70
1"	lf	8,000	0.90	1.00
1 1/2"	lf	7,150	1.25	1.50
2"	lf	2,400	1.50	2.25
2 1/2"d, except 2 1/2" rigid met cond from disch-tun port to & in penstk gate struct	lf	1,000	22.5	3.20
3"	lf	500	2.80	2.50
2½" from disch tun port to & in penstock gate struct	lf	1,400	7.70	4.00
F&i embedded & buried elec nonmet cond, 2"	lf	230	0.75	1.75
3"	lf	200	1.00	2.10
4"	lf	200	1.10	2.55
F&i exposed elec rigid met cond, 1/2"	lf	500	0.80	0.88
3/4"	lf	2,000	1.00	2.00
1"	lf	1,500	1.20	2.15
1 1/4"	lf	900	1.50	2.40
1 1/2"	lf	250	1.60	2.65
2"	lf	500	2.00	3.00
2 1/2"	lf	100	2.60	4.00
3"	lf	650	3.40	5.00
4"	lf	100	4.75	8.20
F&i exposed elec ex met cond, 3/4-2"	lf	100	6.75	8.00
F&i exposed elec nonmet cond, 4"	lf	200	2.35	2.40
F&i met cable ducts	lf	30	31.50	30.00
Rem exist 2-conductor to 12-conductor, No. 19/22 AWG, insul control cables from cond & trenches	lf	3,500	0.06	0.25
F&i 600 volt insul elec wire, No. 12 AWG	lf	13,250	0.09	0.09
No. 10 AWG	lf	20,350	0.12	0.11
No. 8 AWG	lf	7,300	0.18	0.20
No. 6 AWG	lf	4,800	0.25	0.30
No. 4 AWG	lf	2,000	0.35	0.35
No. 1 AWG	lf	3,800	0.60	0.47
No. 2/0 AWG	lf	200	0.90	0.58
F&i No. 19/25 AWG, 600 volt insul elec cable				
2-conductor	lf	500	0.30	0.25
3-conductor	lf	1,000	0.40	0.32
4-conductor	lf	500	0.50	0.42
5-conductor	lf	1,000	0.55	0.48
7-conductor	lf	3,000	0.65	0.55
12-conductor	lf	500	1.00	1.00
F&i No. 19/22 AWG, 600 volt insul elec cable				
2-conductor	lf	500	0.40	0.30
3-conductor	lf	6,000	0.55	0.40
4-conductor	lf	3,000	0.65	0.58
5-conductor	lf	5,000	0.70	0.68
7-conductor	lf	3,700	0.95	0.80
9-conductor	lf	1,500	1.25	1.15
12-conductor	lf	600	1.50	1.30
F&i sing-cond No. 1 AWG, 5,000-v el cab	lf	2,000	1.00	0.95
Making elec conn to elec equip, switchboards, panel boards, & other elec devices inst by others	ea	180	15.00	1.50
Install 2 sets generator voltage switchgear & prot equip cubicle	ls	1	2,750	1,500
3-conductor, No. 4 AWG, 15,000-v insul cable to sta-serv transf	lf	150	3.00	0.73
single conductor, No. 4 AWG, 15,000-v insul cable to generator-neutral grounding transf	lf	50	0.50	0.40
1,250,000 circular mi, 15,000-v insul main power cable	lf	2,000	3.60	1.01
2 sets generator-neutral grounding equip	ls	1	940.00	500.00
power transf, without oil in transf area	lb	178,000	0.02	0.04
115-kv pwr circ brkrs without oil	ea	3	1,260	1,000
Handling, filt, & purfy oil for pwr transf & circ brkrs, & pl oil in transf & circ brkrs	lb	124,000	0.022	0.01
Install dry-type dist transf in serv bldg	lb	850	0.30	0.23

(Continued on page 186)

P&H PAYS OFF 3 WAYS

1 Greater Stability

gives you a higher ratio of lifting capacity in relation to gross weight . . . lets you work faster!

2 More Modern Features

true tractor-type crawlers . . .
low pressure hydraulic control . . .
live roller circle . . .
all-welded construction . . .

3 Unexcelled Service

Genuine P&H parts stocked by dealers . . . backed by nation-wide network of warehouses to keep your jobs on the move.

Help defeat inflation. Demand economy in government spending. Write your congressman.

P&H

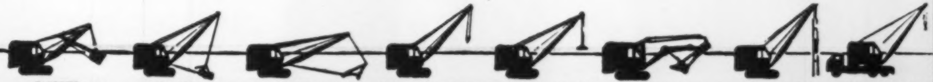
POWER SHOVELS and CRANES
4404 W. National Ave.
Milwaukee 14, Wis.

HARNISCHFEGER
CORPORATION

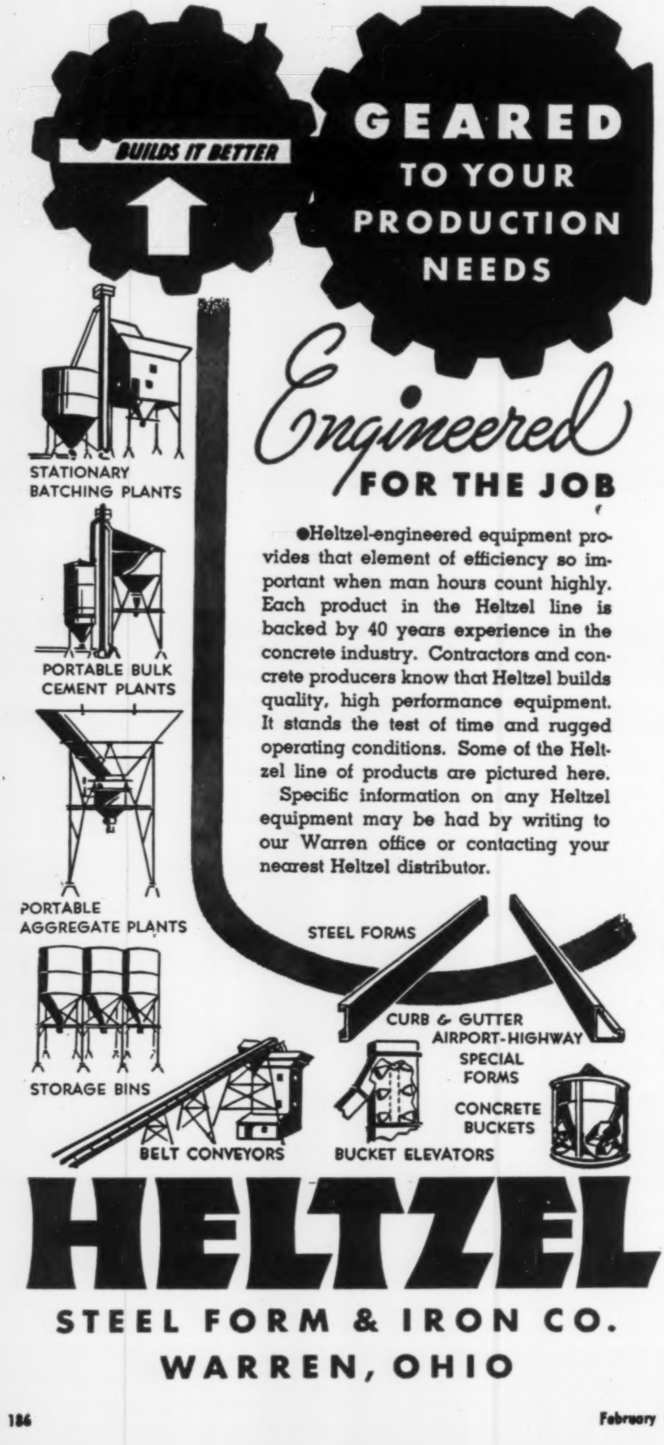
SEE YOUR P&H DEALER

P&H Excavators and Truck Cranes are more easily converted for the various types of service shown below—with hoist and digging drums on one shaft, the need for crawler shafts and gearing is eliminated. You also have a choice of gas, diesel, or electric power. Ask for literature on the size you need.

the P&H Line



POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FAB HOMES



GEARED TO YOUR PRODUCTION NEEDS

Engineered FOR THE JOB

●Heltzel-engineered equipment provides that element of efficiency so important when man hours count highly. Each product in the Heltzel line is backed by 40 years experience in the concrete industry. Contractors and concrete producers know that Heltzel builds quality, high performance equipment. It stands the test of time and rugged operating conditions. Some of the Heltzel line of products are pictured here.

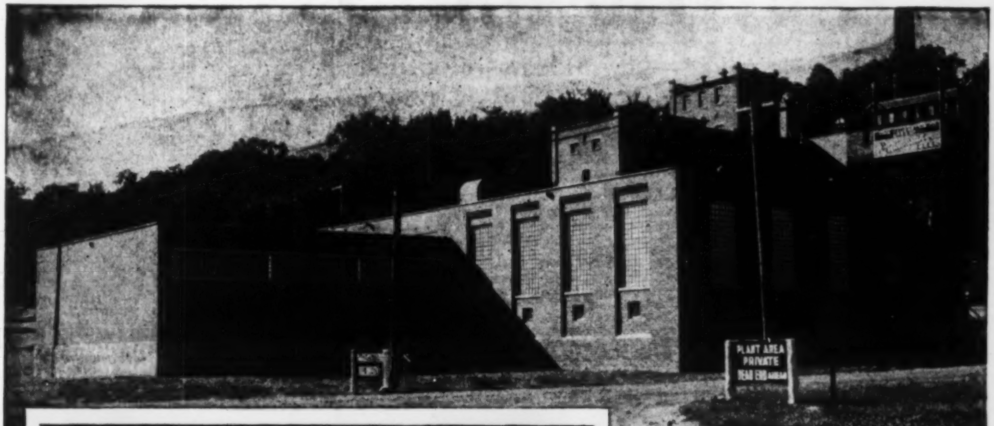
Specific information on any Heltzel equipment may be had by writing to our Warren office or contacting your nearest Heltzel distributor.

HELTZEL

STEEL FORM & IRON CO.
WARREN, OHIO

(Continued from page 184)

Bids: 11-28-51 Items	Unit	Quantity	Unit prices 1C	2
Install 115-kv b is disconn air switches in switchyd & on power transf bus struct	ea	5	630.00	625.00
115-kv selector-type air switches in switchyd	ea	2	825.00	646.00
F&I 300,000 circ mil, copper strain buses in switchyd & on transf circ	lb	3,200	5.25	2.00
3/8", 7-str, stl oh grnd wires	lb	390	6.60	1.10
iron-pipe-size copper tub in switchyd & transf area, 1"	lb	330	8.80	2.00
1 1/4"	lb	420	7.50	5.00
2 1/2"	lb	1,000	2.75	3.20
600,000-circular mil bare str copper cable from pwr transfr low-volt leads to main-pwr cab potheads	lf	30	26.00	16.50
Install 4" W I pipe wyes for pipe bus	ea	6	58.00	80.00
Straight portions of 4" iron pipe bus	lf	225	7.70	2.50
wi pipe bends, pipe bus, 4"	ea	6	28.00	80.00
conn for 4" pipe bus	ea	35	16.00	40.00
termis for pipe bus	ea	6	16.50	30.00
F&I corona balls in open end of pipe bus	ea	6	26.00	50.00
bronze tee conn on pipe bus	ea	3	40.00	41.50
pipe bus suppts insul		6	275.00	250.00
galv-stl fixed suppts for pipe bus	ea	3	29.00	75.00
galv-stl sliding suppts for pipe bus	ea	6	31.00	100.00
Disconn mov, reinstall 3 15-kv potential transf & suppts struct	ls		880.00	1,000
last span of Boysen ne incl conductors, gr wires, insul & hdware, wave trap, coupl capas, tie-down assemb & frame, attached carrier-current tun unit & connect	ls	1	2,400	2,100
Install 115-kv coupl capac	lb	720	0.22	0.42
current transf in neutl grd cir of pwr transf	lb	250	0.75	0.70
575-b transf sw, in serv bldg	lb	80	1.10	0.70
new main cont bd sect	lb	6,000	0.20	0.42
1 aux control board	lb	5,000	0.22	0.40
Inst sta-serv unit substa	lb	20,000	0.085	0.11
low-v AC, floor-mtd pwr dist boards	lb	2,500	0.17	0.40
dry-type 150-kva dist transf for sta ltg	lb	3,000	0.12	0.22
2 CO, contr cabs & assoc equip	lb	400	1.95	0.20
F&I 460-v, 60 amp, 3-phs power recept compl with met encl & match plugs	ea	7	82.50	90.00
Disconn, dismount, mov reinst exist main contr-board sect	lb	5,250	0.40	0.45
dc-power dist board	lb	400	1.45	0.70
batt-chrgr control bd & dc pwr supp bd assemb	lb	1,000	1.05	0.70
2 battery-charg motor generator sets	lb	600	0.90	0.70
station stor battery & battery rack	lb	8,000	0.145	0.10
F&I pow cont conductors for 125-t trav crane	lb	1,000	2.00	1.50
cable racks & hooks in control cable trench	lb	1,800	3.70	1.20
inc ltg fixt, in pr p	ea	190	50.00	30.00
in cable tun	ea	2	22.00	30.00
48" fl ltg fixt in pp	ea	40	86.00	60.00
96" f	ea	19	223.00	225.00
fl dist pan bds for lgt in power plant	ea	2	503.00	275.00
dist panel boards for light in pp	ea	2	490.00	275.00
light system wiring devices in pp	ea	132	22.00	8.00
Finish recesses for light units in pp	ea	4	12.00	25.00
light panel board recesses in pp	ea	6	10.00	40.00
F&I lgt fix in switchyd & transf area stl struct	ea	7	126.00	100.00
weather-proof outdoor-type plug receptacles on switchyd & transf area stl struct	ea	5	72.00	25.00
ransp matl r railhead pp site		4,000	6.00	10.00
Mov in, set up, dismant, remov drill equip & clean up	ls	1	275.00	6,000
Drill hole in rock for 12" ID casing	lf	17	9.50	15.00
nst 12" d casing	lf	40	9.50	3.50
Drill 10" d hole in rock between depths of 17 ft & 300 ft	l	283	9.50	12.00
depths of 300 & 400 ft	f	100	9.50	20.00
Developing the well	hr	10	13.75	40.00
Testing well	hr	.8	13.75	20. 0



THIS NEW bottling plant of the John Hauenstein Company brewery, New Ulm, Minnesota, utilized PC Functional Glass Blocks as a basic element of its architecture. These glass blocks scientifically direct adequate daylighting where it is needed. They reduce sash maintenance, guard sanitation, make surroundings more comfortable. Architect: Edward F. Wirtz, New Ulm, Minn.

PC Glass Blocks are immediately available . . . no construction delays!

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **Massachusetts**—B.A. About 2/21—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., channel imprvs., Tophet Brook, Adams. $210,000.

† **Massachusetts**—B.A. 3/1—U. S. Eng., 80 Lafayette St., New York 13, N. Y., channel excav., constr. 650 ft. concrete chute, North Adams, Hoosic River Basin, Junction Reach. $100,000-$500,000. CD 1/4.

▲ † **Mass., Bedford**—LABORATORY—B.A. 3/4—U. S. Eng., 857 Commonwealth Ave., Boston, air defense laboratory, Eng. 19-016-52-33. Plans deposit $100. CD 1/18.

† **Mass., Bedford**—LABORATORY—B.A. 3/6—U. S. Eng., 857 Commonwealth Ave., Boston, building, facilities, Air Defense Laboratory, adjacent to Hanscom Airport off Woods St., ENG 19-016-52-33. $500,000. CD 1/30.

† **N. H., Portsmouth**—DORMITORIES, etc.—B.A. Early in May—U. S. Eng., 857 Commonwealth Ave., Boston 15, Mass., airmen's dormitories, mess and administration bldgs., Portsmouth Municipal Airport, Eng 19-016-52-38. Plans deposit $60. CD 12/27.

BIDS ASKED—BUILDINGS

† **Mass., Hingman**—POWER PLANT—B.A. 2/20—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, misc. equip. repairs, power plant, Bldg. 28, Naval Industrial Reserve Shipyard, NOY 70871, Spec. 31260. CD 4/6/51.

Mass., Hanover — SCHOOL — B.A. About 2/21 — Town, Consolidated Elementary School, Silver St. Mark Linenthal, 16 Lincoln St., Boston, engr. CD 3/22/51.

▲ **N. H., Keene**—HIGH SCHOOL—B.A. 2/21—Union School Dist., Supt. Schools, 17 Washington St., 1 story, brick, steel, concrete Junior High School. $1,-000,000. Plans deposit $50. James A. Britton, 315 Federal St., Greenfield, Mass., archt. CD 9/26.

▲ **Mass., Holden**—SCHOOL—B.A. 2/27—Office of Supt. Schools, Holden, regional high school, for Towns of Paxton, Princeton, Rutland and Sterling, Wachusett Regional High School, Laurelwood Rd., Holden. $1,500,000. Plans deposit $150. L. W. Briggs Assoc., Inc., 90 Park Ave., Worcester, archts. CD 10/3.

Conn., Bridgeport—HOUSING—B.A. 2/28—The Housing Auth. of City of Bridgeport, 252 Hallett St., construction and finishing complete "Beardsley Terrace," State Moderate Rental Housing Development, Proj. Conn. Mr-40, consisting of thirteen apartment type dwelling structures and boiler house and administrative bldg. containing 832 dwelling units, Trumbull Avenue Site. Plans deposit $100. Harry G. Lindsay & Fred. C. Johnson, 211 State St., archt. CD 7/25.

Me., Van Buren—HOUSING—B.A. 2/28—Van Buren Housing Auth., Town Hall, housing, Proj. PHA Maine 1-1. Plans deposit $50 refundable. CD 1/15.

Mass., Wellesley—SCHOOL—B.A. 2/28—Town, School Bldg. Com., Wellesley, school, Elmwood Rd. $465,000. Plans deposit $40. Adden, Parker, Clinch & Crimp, 177 State St., Boston, archts. CD 2/14/51.

▲ **R. I., Providence**—HOUSING—B.A. 2/28—Providence Housing Auth., 263 Chad Brown St., RI-16, Hartford Park Exten. Housing, Hartford Rd. Plans deposit $100. CD 1/4.

▲ **Conn., Norwalk**—HOUSING—B.A. 3/4—City Housing Auth., Washington Village, South Norwalk, CONN 2-2 low rent housing, $2,700,000. Plans deposit $50. S. W. Hoyt, Jr. Co., Inc., 5 Railroad Ave., South Norwalk, engr. Gilroy & Gaydosh, 64 Wall St., Norwalk., assoc. archts. Holden McLaughlin & Assoc., 570 Lexington Ave., New York, N. Y., archts. CD 2/14.

▲ **Conn., Norwalk**—HOUSING—B.A. 4/7—City Housing Auth., Washington Village, South Norwalk, CONN. 2-2 low rent housing, Springwood Area, $2,700,000. Plans deposit $50. Extended date. CD 2/1.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Cass-Warner Corp., 21 Pearl St., Essex Junction, Vt., LB **$69,192**, storm water and sanitary sewerage sys., SOUTH BURLINGTON, VT., Fire Dist. 3, South Burlington, Vt. Bids Jan. 29. CD 1/4.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Peter Salvucci, 55 Pond St., Waltham, Mass. CA **$2,035,754**, est. $2,100,000. hy., bridge Auto Rte. 3, Bedford, Billerica and Burlington. CD 1/28, under LB.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Old Colony Constr. Co., Vernon St., Quincy, Mass. LB **$67,944**, est. $77,000. hy. reconstr. and bridge, Rte. 28, Randolph. Bids Jan. 29.

CONNECTICUT—State Hy. Dpt., State Office Bldg., Hartford,

Brunalli Constr. Co., 19 Main St., Southington, Conn., LB, **$138,019**, culvert and approaches Griswold-Voluntown. LB **$137,883**, bridge and approaches, Vernon. Bids Jan. 28. CD 1/16.

BUILDINGS

LOW BIDS AND CONTRACTS

Central Engineering & Constr. Co., 210 Main St., Pawtucket, R. I. CA **$200,000**. MANUFACTURING BLDG., DEXTER, ME. The Fayscott Corp., 225 Spring St., Dexter, Me.

George B. H. Macomber, 19 Milk St., Boston, Mass. CA **$150,000**. FACTORY addn., ACTON, MASS. Rex Corp., 51 Lansdowne St., Cambridge, Mass. Bids Jan. 8. CD 1/10.

J. J. Powers Co., 238 Main St., Cambridge, Mass. CA **$110,000**. WAREHOUSE and OFFICE, Alewife Brook Parkway, CAMBRIDGE, MASS. Lewis E. Tracy Co., 419 Atlantic Ave., Boston, Mass. Brask Eng. Co., 177 State St., Boston, Mass., engr. Bids Dec. 11. CD 12/6.

Aberthaw Co., 80 Federal St., Boston, Mass. CA, Approx. **$100,000**. altering MILL BUILDINGS for mfg. electrical material, LAWRENCE, MASS. Western Electric Co., Inc., 195 Broadway, New York, N. Y.

▲ **Louis H. McAloon Jr.**, 17 Third St., North Andover, Mass. CA **$1,738,375**. HOUSING, Proj. PHA 10-2, Beacon Ave., Beacon and Andover Sts., LAWRENCE, MASS. Lawrence Housing Auth., Lawrence, MASS. CD 1/29 under LB.

▲ **Concrete Constr. Co.**, 11 Garfield, Ave., Chelsea, Mass. LB **$1,042,800**. elementary SCHOOL addn., alterations, Pickering Junior High SCHOOL, Conomo Ave., LYNN, MASS. City, School Dpt., 42 Franklin St., Lynn, Mass. Bids Jan. 29. CD 12/27.

Aquadro & Cerruti, Inc., Texas Rd., Northampton, Mass. LB **$460,036**, est. $550,000. superstructure veterans HOUSING, Proj. PHA 26-1, NORTHAMPTON, MASS. Northampton Housing Auth., F. A. Farrar, chn., 46 Harrison Ave., Northampton, Mass. Bids Jan. 16. CD 12/31.

▲ **Westcott Constr. Co.**, 42 Weybosset St., Providence, R. I., LB **$2,184,753**, PHA R 1-2-2, low rent HOUSING, Crook Manor, PAWTUCKET, R. I. Pawtucket Housing Auth., 560 Prospect St., Pawtucket, R. I. Bids Jan. 30. CD 1/8.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. J., Westmont—B.A. 2/19—Haddon Twp. Comn., Westmont, sewage pumping station, force main and sanitary sewers, $90,000. John H. Osler, Collingswood, engr.

† **New York**—B.A. On Or About 2/20—U. S. Eng., 24 St. and Maryland Ave., P. O. Box 1715, Baltimore 3, Md., clearing and snagging project at Owego, Tioga Co. within the channel of Owego Creek from its confluence with the North Branch of Susquehanna River upstream approx. 1.7 mi. to dam of the Owego Light and Power Co. and on islands in North Branch of Susquehanna River at mouth of Owego Creek, Serial No. CIVENG 18-020-52-29. CD 4/21/44.

Delaware—B.A. 2/20—State Hy. Dpt., Dover, sluiceway, south of Augustine Beach, Contr. 1171, New Castle Co. Plans deposit $5. Richard A. Haber, ch. engr.

† **New York**—B.A. 2/20—U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore 3, Md., clearing and snagging at Owego, Tioga Co., within channel of Owego Creek from Owego Light and Power Company Dam downstream approx. 1.7 mi. to its confluence with North Branch of Susquehanna River and on islands in Susquehanna River at mouth of Owego Creek, Serial No. CIVENG 18-020-52-29. CD 1/16.

N. J., Newark—PASSENGER TERMINAL—B.A. 2/21—At office Chief Engineer of the Port of New York Authority 111 8 Ave., New York, 11, N. Y., passenger terminal at Newark Airport, Cont. NA-170.035. Plans deposit $100. CD 1/16/50, under LB.

† **Pa., Phila.**—B.A. 3/6—U. S. Eng., 121 N. Broad St., Zone 1, roads, sidewalks, gate imprvs., Frankford Arsenal, Bridge and Tacony Sts., Inv. No. ENG 36-109-52-196. Plans deposit $5.

BIDS ASKED—BUILDINGS

† **Md., Bainbridge**—GAS STORAGE—B.A. 2/19—Dist. Pub. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va., gas storage bldg., U. S. Naval Hospital, NOY 70259, Spec. 32533. Plans deposit $10. CD 3/27/51.

Pa., Marietta—HOUSING—B.A. 2/19—U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore 3, Md., construct, manage, finance, 12 family unit and 28 family unit housing Project 52-28, for Marietta Transportation Corps Dpt. Corps Engrs., Plans deposit $10. CD 1/18.

Pa., New Cumberland—HOUSING—B.A. 2/19—U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore 3, Md., construct, manage, finance Wheery Housing Proj. No. 52-28, 50 unit housing, New Cumberland General Depot, Serial No. ENG 18-020-52-28. Plans deposit $10. CD 1/18.

† **Pa., Marietta**—WAREHOUSE—B.A. On or About 2/20—U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore 3, Md., open storage warehouse, Marietta Transportation Corps Depot, Serial No. ENG 18-020-52-31. Plans deposit $15.

† **Pa., Fort Mifflin**—WAREHOUSE—B.A. On or About 2/20—U. S. Eng., 121 N. Broad St., Phila. Zone 1, one 50x117 ft. concrete masonry warehouse at Corps of Engineers Reservation, on west shore of Delaware River approx. 1 mi. below mouth of Schuylkill River, Inv. No. CIV. Eng 36-109-52-35.

N. J., Port Newark—BUILDING—B.A. 2/20—At office, Chief Engineer, Port of New York Auth., 111 8 Ave., New York, 11, N. Y., constructing Building 139, Contr. PN-150.003. Plans deposit $25.

† **Pa., Fort Mifflin**—WAREHOUSE—B.A. 2/20—U. S. Eng., 121 N. Broad St., Phila., Zone 1, concrete masonry warehouse at Corps of Engineers Reservation, on west shore of Delaware River, approx. 1 mi. below mouth of Schuylkill River, Eng 36-109-52-35. CD 1/24.

▲ **Md., Jessups**—INSTITUTE—B.A. 2/21—State, Dpt. P. Imprvts., 506 Park Ave., Baltimore, Zone 1, 1 and 2 story (ultimately 3 story) 40x470 ft., brick, block, concrete, steel Patuxent Institute for Delinquent Defectives with four 32x160 ft. wings, 85x105 ft. boiler plant, near here, Job. P-DD-49-01, $1,250,-000, Plans deposit $20, Lucius R. White, Jr., 1009 N. Calvert St., Baltimore, archt. Whitman, Requardt & Assoc., 1304 St. Paul St., Baltimore, engrs. CD 5/8/50.

N. Y., Schenectady—SCHOOL—B.A. 2/21—Bd. Educ., 108 Union St., Woodlawn Elementary School. $700,-000. Perkins & Will, 309 W. Jackson Blvd., Chicago 6, Ill., archts. CD 6/19/50.

▲† **N. J. Fort Dix**—TROOP SPACES—B.A. 2/26—U. S. Eng., 121 N. Broad St., Phila., 1, Pa., permanent troop spaces Phase No. 1, Fort Dix, Burlington Co. ENG 36-109-52-160. CD 9/13.

▲ **Pa., Pittsburgh**—HIGH SCHOOL—B.A. 2/26—North Allegheny Joint Auth., Allegheny Co., Old Perry Hy., R.D. 7, Pittsburgh, Zone 29, Junior and Senior High School, McCandless Twp. Plans deposit $100 general constr., $50 for other. Mitchell & Ritchey, 524 Fourth Ave., archts. CD 11/20/47.

▲ **Pa., West View**—HIGH SCHOOL—B.A. 2/26—North Allegheny Joint Auth., R. D. 7, West View, 1 story Junior-Senior High School, in McCandless Twp. $1,902,500. Mitchell & Ritchey, 4th Ave., Pittsburgh, archts.

▲ **N. Y., Long Beach**—HIGH SCHOOL—B.A. 3/10—Bd. Educ., Union Free School Dist. 28, Long Beach, ele-

(Continued on page 193)

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

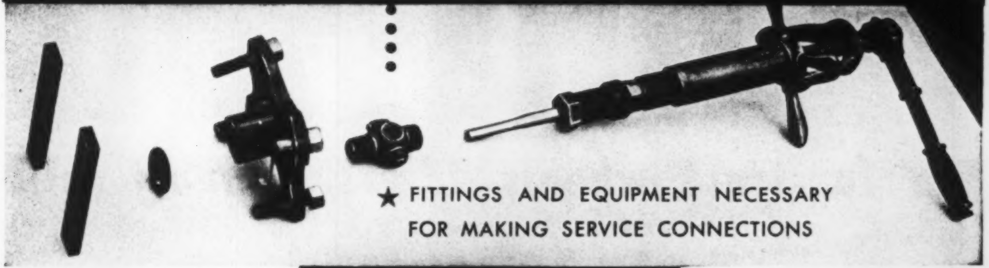
CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

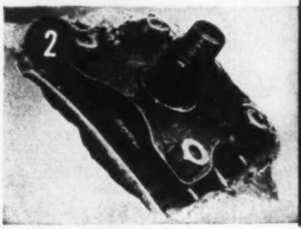
Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

SERVICE CONNECTIONS are no problem in LOCK JOINT Reinforced Concrete CYLINDER PIPE


★ FITTINGS AND EQUIPMENT NECESSARY FOR MAKING SERVICE CONNECTIONS

1


2

HOW TO TAP

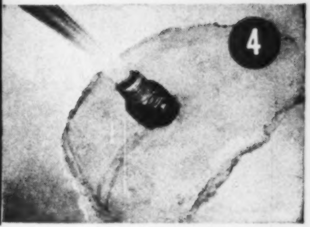
1 Remove concrete down to cylinder in area to be tapped.

2 Assemble fittings around bars of reinforcing cage, drawing gland down firmly so that gasket fits tightly against cylinder.

3 Mount tapping drill on corporation stop and tap.

4 When tap is completed, protect steel fittings with a cement mortar encasement.

3


4

Making a service connection under pressure in a Lock Joint Reinforced Concrete Cylinder Pipe is that simple.

Yet with these few steps a foolproof tap is always achieved. There can be no cross-threading, no loss of alignment and no damaging of the pipe with attendant costly shut-downs and repairs.

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SCOPE OF SERVICES

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1000 Hour

for truck wheels, idlers, support rollers

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Think of it! You can operate for 6 months on a 40-hour-week basis with just one lubrication of 14 to 20 of the most-abused, hardest-to-service points on a tractor. It's possible through an exclusive combination of glass-smooth Positive Seals and anti-friction bearings that help you do more work at lower cost even under toughest conditions! And it's another ahead-of-the-field design feature found only in the four new Allis-Chalmers tractors.

These Big Benefits Mean DOLLARS to you!

DAILY GREASING PERIODS ELIMINATED. You save at least 30 minutes every day . . . gain about one full month's production every year.

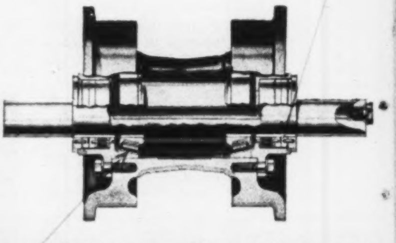
FULL PROTECTION ASSURED. Positive Seals keep grease in . . . dirt and moisture out. 1000-Hour Lubrication gives you protection unchallenged in the tractor field.

SAVES ON GREASE. Truck wheels, idlers and support rollers are grease-filled at the factory . . . need new grease only once every 1000 hours!

EASY TO SERVICE. No more cleaning of dirt, muck and grime from fittings every day. Operator can choose time and place to regrease when conditions are favorable.

Here's the secret:

Positive Seals each have two spring-loaded steel rings — one stationary, the other turning with the wheel. Ground smooth as glass, they seal the grease in . . . keep dirt, grit, dust, mud and water *out*.



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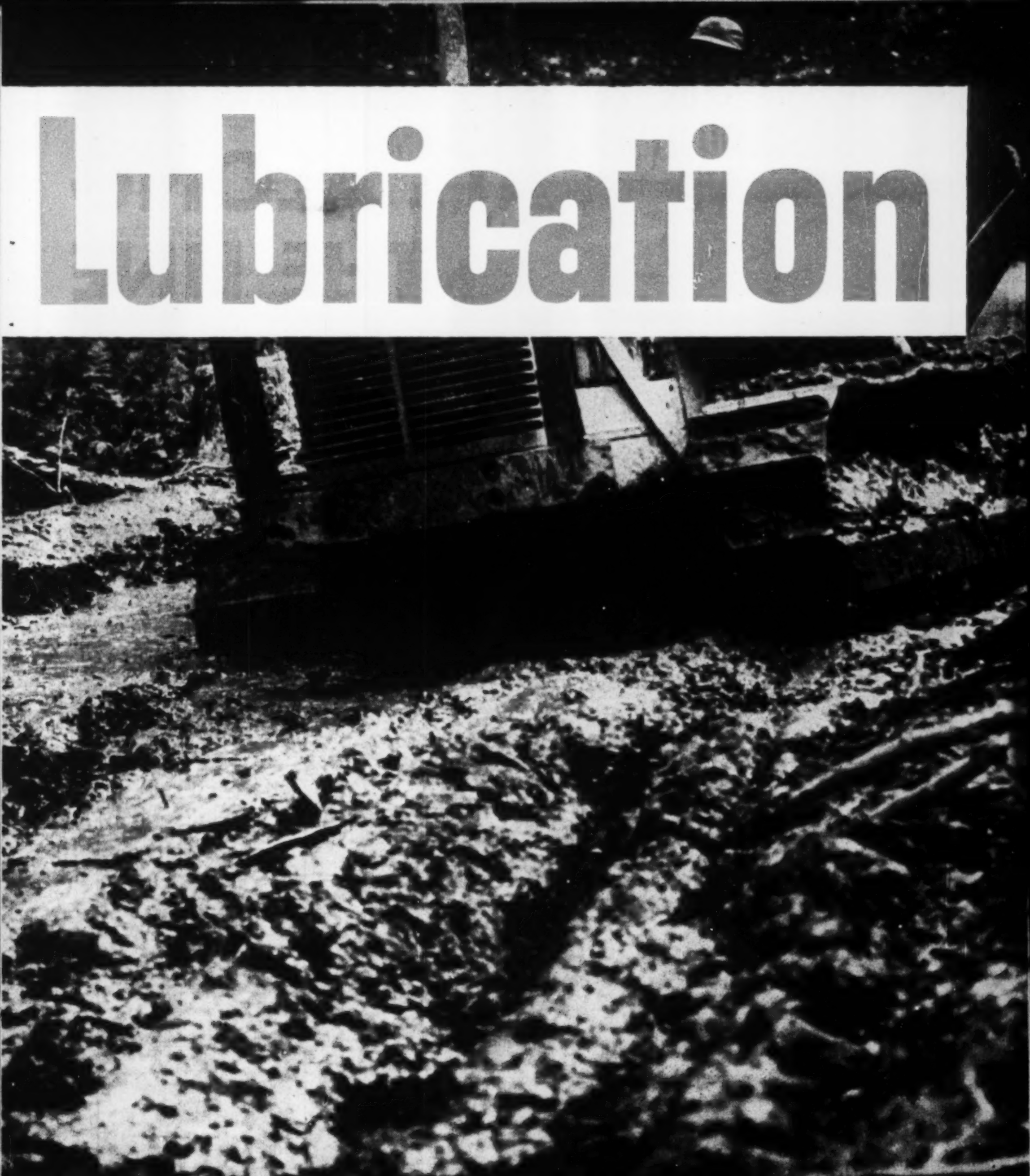
Lubrication



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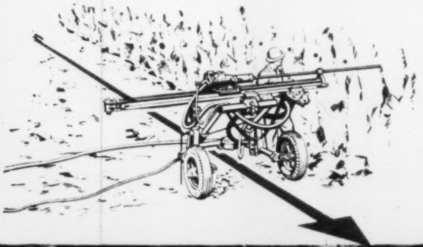

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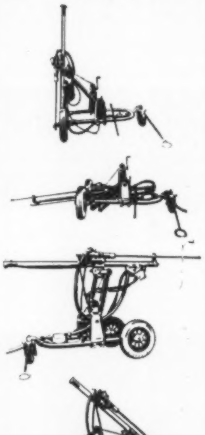
with the NEW FM-3 WAGON DRILL

1. **MAXIMUM DRILLING POWER.** The heavy duty X-71WD Rock Drill is the only drill made especially for Wagon Drill Service. Its drilling speed and hole cleaning ability are recognized wherever Wagon Drills are used. It has the power and stamina that mean extra long life, even on the toughest jobs.
2. **UNLIMITED VERSATILITY.** The new FM-3 Wagon Drill Mounting features an improved lifting mechanism and rugged yoke, designed to permit fast, easy drilling in any desired position—for line holes, toe holes, horizontal holes along a face, or angle drilling in floor or face.
3. **MINIMUM SET-UP TIME.** A powerful worm gear mechanism raises the yoke and drill guide quickly and easily, at the turn of a crank. Angular position of the drill guide is adjusted by a quick-acting universal cone-type clamp.

When fast-drilling, longer-lasting Carset Jackbits are used with the FM-3 Wagon Drill, you've got a drilling team that's unequaled for speed, efficiency, and economy of manpower.

Remember, Ingersoll-Rand's complete line of rock drilling equipment is sold and serviced by men who are skilled specialists in the field. Write or phone your nearest I-R representative for further information.

Permits Easy Drilling in Any Position



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CARSET JACKBIT
SET WITH CARBOLOY INSERTS
manufactured exclusively by
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Ingersoll-Rand
11 BROADWAY, NEW YORK 4, N. Y.

680-5

(Continued from page 188)

mentary and Junior High School, Lido Beach. $2,000,000.

† **Pa., New Cumberland**—WAREHOUSE—B.A. On Or About 3/5—U. S. Eng., 24 St. and Maryland Ave., P. O. Box 1715, Baltimore 3, Md., Warehouse 85 and appurtenant work, New Cumberland General Depot, Serial No. ENG 18-020-52-33. Plans deposit $25.

† **Pa., Phoenixville**—HOSPITAL—B.A. 3/5—U. S. Eng., 121 N. Broad St., Phila., Zone 1, construct alterations, extens. to Bldg. 18, Valley Forge General Hospital, State Hy. 113, 1 mi. west of here, Inv. No. ENG 36-109-52-188. Plans deposit $5. CD 6/27.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **U. S. Eng.,** 80 Lafayette St., New York 13, N. Y. rejected bids Jan. 11, 2 pile platform in Hudson River, JONES POINT, N. Y.

† **Joseph E. Bennett Co. Inc.,** 105 Newbury St., Boston, Mass., LB **$558,500, addnl.** bldgs. Part 1, incl. fire station, bachelor officers quarters, guard house, warehouse, refrigeration storage bldgs. and utilities at Niagara Falls Air Force Base, NIAGARA FALLS, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Jan. 23. CD 1/3.

† **Dpt. Navy,** P. Wks. Office, Phila. Naval Base, Phila., Pa. rejected bids Jan. 4, Hangars A and B alterations, NOY 24958, Spec. 27062, ATLANTIC CITY, N. J. L.B. **$140,500. Will re-advertise.** CD 1/17, under LB.

PENNSYLVANIA—State Hy. Dpt., 506 North Office Bldg., Harrisburg,

New Enterprise Stone & Lime Co., Inc., New Enterprise, Pa., CA. **$561,707.** wid'n. 9,094 ft. roadway with Plain c. conc. base and bit. surf. new and existing base T.R. 36, 220, Blair Co. Bids Jan. 18, awarded Jan. 31. CD 1/22, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

New Enterprise Stone & Lime Co., New Enterprise, Pa., LB **$92,973,** plain c. conc. base with bit. surf. 1,752 ft., 37 ft. wide, T.R. 22 Alt., Blair Co.;

A. H. Blank, P.O. Box 208, Oil City, Pa., LB **$194,366,** wid'n. 14,150 ft. roadway with crushed aggregate base and bit. surf. new and existing pavement 24 ft. wide, T.R. 5, Erie Co.;

A. E. O'Block, Unity, Pa., LB. **$1,124,201,** construct 50,990 ft. roadway with crushed aggregate base, bit. surf. and bit. surf. existing pavement T.R. U.S. 22, 259, 3, Indiana Co.;

The Kelley & Meyer Co., 1211 Gibson St., Youngstown, O., LB **$143,487,** bit. surf. existing pavement and bridge floors 36,584 ft., T.R. 78, Mercer Co.;

F. D. Kessler, Inc., Northumberland, Pa., LB **$356,621,** wid'n. 29,648 ft. roadway with crushed aggregate base, bit. surf. TR. 15, Union and Lycoming Counties. Bids Feb. 1. CD 1/10.

C. B. Constr. Corp., 1121 Frankford Ave., Phila., Pa., LB **$333,000** fire alarm distr. sys. and revamping of fire alarm system, NORRISTOWN, PA. Dept. Property & Supplies, 319 N. Front St., Harrisburg, Pa. Bids Jan. 23. CD 1/9.

† **Arundel Corp.,** Pier 2, Pratt St., Baltimore, Md. LB **$700,250.** 1,120,400 cu. yd. Baltimore Harbor and channel dredging and maintenance, CIVENG 18-020-52-14, MARYLAND. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. Bids Jan. 11. CD 12/14.

▲ **Washington Suburban Sanitary Comm.,** 4017 Hamil- St., Hyattsville, Md. Own Forces, under supervision of Ambursen Engineering Corp., engrs., 295 Madison Ave., New York 17, N. Y. **$3,000,000.** Rocky Gorge Dam and pumping station, etc., on Patuxent River near Laurel, HYATTSVILLE, MD. Bids 12/7 rejected. CD 1/24, under LB.

Heer Bros., Inc., 105 E. 25 St., Baltimore, Md. LB **$170,000.** exten. steam lines Springfield State Hospital, SYKESVILLE, MD. State, Dpt. P. Imprvs., 506 Park Ave., Baltimore, Md. Jas. Posey & Assoc., 10 E. Pleasant St., Baltimore, Md., engrs. CD 12/7/50, under Public Bldgs.

McElwee-Courbis Constr. Co., Inc., 503 Market St., Camden, N. J., LB, **$232,860,** 2 sewage pumping stations, Red Clay Creek and Richardson Park, NEW CASTLE, DEL. New Castle County Levy Court, Municipal Bldg., Wilmington, Del. Whitman, Requardt & Assocs., 1034 St. Paul St., Baltimore, Md., engrs.

BUILDINGS

LOW BIDS AND CONTRACTS

Oakland Lakeview Homes, c/o A. H. Salkowitz, archt., 37-60 82 St., Jackson Heights, N. Y. Owner builds. **$600,000.** 39 HOUSES, 217 St. and 54 Ave., BAYSIDE, N. Y.

▲ **William P. & Lawrence Hahn,** 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. Approx. **$4,000,000.** 250 HOUSES and SHOPPING CENTER, on 46 acre site bounded by Hempstead Turnpike, Massapequa and Glencove Rds. and Wantagh Ave., BETHPAGE, N. Y.

▲ **Veit & Co.,** 260 Devoe St., Brooklyn 11, N. Y., CA. Approx. **$1,000,000.** altering SCHOOL, Driggs Ave., N. 5 to N. 6 Sts., for St. Francis Prep. School, BROOKLYN, N. Y. St. Vincent de Paul Parish, N. 6 St. and Driggs Ave., Brooklyn, N. Y. CD 9/27.

† **Harold A. Brandt,** 12 E. 41 St., New York 17, N. Y. CA. **$693,170,** steel, concrete BATTERY PLANT, incl. sewer, water, electric utilities and access roads, COLD SPRING, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids About Jan. 25. CD 1/11.

North Vale Homes, c/o A. H. Salkowitz, archt., 37-60 81 St., Jackson Heights, N. Y., Owner Builds. Approx. **$700,000.** 50 HOUSES, 156 St. north of Horace Harding Blvd., FLUSHING, N. Y.

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KINNEAR Rolling Doors are HERE TO STAY!

Like the rolling action of the wheel, the smooth upward operation of Kinnear Rolling Doors involves basic, unchanging principles of engineering efficiency. The door's advantages have been proved in thousands of installations, through more than half a century.

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† **Michael Constr. Corp.**, 142 19 St., Brooklyn 32, N. Y., CA. **$696,250**, WAREHOUSES, Eng 30-075-52-318, FORT JAY, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Jan. 22. CD 1/16.

Slattery Constr. Co., Inc., 46-36 54 Rd., Long Island City, N. Y., LB **$632,000**, foundations and appurtenances for Highbridge HOUSES (Proj. No. NY 5-26) in area bounded by Major Deegan Blvd. (Sedgwick Ave.) W. 167 St., University Ave. and a line approx. 135 ft. north of W. 165 St., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Bids Jan. 25. CD 1-21.

Raylin Constr. Corp., 11 W. 42 St., New York 18, N. Y. CA. **$417,000**. yard work at Bird S. Coler HOSPITAL, NEW YORK, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Nov. 28, awarded Jan. 10. CD 11/15.

Modern Constr. Co., 1969 Hamburg St., Schenectady, N. Y. CA. **$477,287**, general constr. Grout Park Elementary SCHOOL, Hamburg St. and Abbotsford Rd., SCHENECTADY, N. Y. City School Dist., Comr. Contr. & Supply, 108 Union St., Schenectady, N. Y. Bids Jan. 17. CD 1/9.

▲† **Terminal Constr. Corp.**, 194 Hackensack St., Wood Ridge, N. J., CA, **$2,685,298**, BARRACKS, FORT MONMOUTH, N. J. U. S. Eng., 80 Lafayette St., New York, 13, N. Y. Bids Jan. 8. CD 11/30.

Wigton-Abbott Corp., 1225 South Ave., Plainfield, N. J., CA, **$100,000**, WAREHOUSE at site, NEWARK, N. J. Pyrene Mfg. Co., 560 Belmont Ave., Newark, N. J.

▲ **Yves Nedellec**, c/o Percy Simon, archt. 362 Cedar Lane Teaneck, N. J., Owner Builds, **$2,000,000**. 200 houses on 69-acre tract, Carneer and Vandenburgh Aves., RUTHERFORD, N. J.

Ranch Home Builders, Inc., 1508 W. Allegheny Ave., Phila., Pa., Separate Contracts. Approx. **$650,000**. RESIDENTIAL DEVELOPMENT, Cedar Rd., AMBLER, PA.

John S. McQuade, Jr., 1322 Parrish St., Phila., Pa., CA. **$761,049**, general contr. Junior-Senior HIGH SCHOOL and roadway, for Upper Chichester Twp. School Dist., BOOTHWYN, PA. State Public School Bldg. Auth., 1400 N. Cameron St., Harrisburg, Pa. Bids Jan. 24. CD 129, under LB.

Richard D. Lodge, 207 C-David Dr., Bryn Mawr, Pa., Separate Contracts. Approx. $300,000. RESIDENTIAL DEVELOPMENT, Eaverly Rd., BRYN MAWR, PA. Karl F. Otto, 1528 Buckingham Dr., Rosemont, Pa., archt.

Ranallo Constr. Co., Inc., 50 26th St., Pittsburgh 22, Pa., LB **$597,750**. general constr. Junior HIGH SCHOOL for Jefferson Twp. School Dist., JEFFERSON TWP. (P.O. Large), PA. State Public School Bldg. Auth., 1400 N. Cameron St., Harrisburg, Pa., Bids Jan. 30. CD 1/4.

Ar-Neil Home Imprvt. Co., 429 W. Girard Ave., Phila., Pa., Separate Contracts. Approx. **$82,000**. 1 story masonry MFG. BLDG., PHILA., PA.

George Betz, 7501 Central Ave., Cheltenham, Pa., Separate Contracts. Approx. **$300,000**. RESIDENTIAL DEVELOPMENT, Rockwell St., etc., PHILA., PA.

Leonard Elkins, 2852 Devereaux St., Phila., Pa., CA. **$300,000**. RESIDENTIAL DEVELOPMENT, Verree Rd., PHILA., PA. Pine Valley Homes, Inc., Lincoln Liberty Bldg., Phila., Pa.

J. Cutler Sons & Co., 1615 Chelten Ave., Phila., Pa., Separate Contracts. Approx. **$300,000**. RESIDENTIAL DEVELOPMENT, Northeast Sect., PHILA., PA.

Manor Homes, Inc., 1611 Nedro Ave., Phila., Pa., Separate Contracts. **$300,000**. RESIDENTIAL DEVELOPMENT, Griffith St., etc., PHILA., PA.

Morris Cutler, 6333 N. Broad St., Phila., Pa., Separate Contracts. **$300,000**. RESIDENTIAL DEVELOPMENT, Lawndale sect., PHILA., PA.

J. J. McNally, 2703 W. Willard St., Phila., Pa., CA. Approx. **$150,000**. Central Heating PLANT, PHILA., PA. Heintz Mfg. Co., Front St. and Olney Ave., Phila., Pa., Kuljian Corp., 1500 N. Broad St., Phila., Pa., engrs.

Domenico Rea, 27 Woodlawn Ave., Pittsburgh 5, Pa., LB **$374,480**. construct Hebron Elementary SCHOOL for the Penn Twp. School Dist., PENN TWP. (P.O. Verona, R.D.), PA. State Public School Bldg. Auth., 1400 N. Cameron St., Harrisburg, Pa. Bids Jan. 24. CD 1/4.

Baton Constr. Corp., 1717 Sansom St., Phila., Pa., CA. **$300,000**. Windsor Central OFFICE between Levittown and Danherst, LANGHORNE, PA. Bell Telephone Co., 1835 Arch St., Phila., Pa. The Pepper Assoc., 225 S. 15 St., Phila., Pa., archts. Charles H. Wolf, 112 S. 16 St., Phila., Pa., engr.

William F. Lotz, Orthodox St. and Adams Ave., Phila., Pa., CA. Approx. **$150,000**. 1 story, 80x143 ft., MFG. BLDG., 56x56 ft. BOILER HOUSE addns., brick, steel constr., MANHEIM, PA. Raybestos-Manhattan, Inc., Manheim, Pa.

† **Malan Plumbing, Inc.**, 25-09 42 Rd., Long Island City, N. Y. CA. **$718,200**, 7 STORAGE SHEDS, construct fire walls, sprinkler systems, valve sys., NEW CUMBERLAND, PA. Dpt. Army, 24 St. and Maryland Ave., Baltimore, Md. Bids Jan. 15. CD 1/24, under LB.

† **Kahn Engineering Co.**, 427 O St. S.W., Wash., D. C. LB **$398,179**. Surveillance OFFICE and SHOP, DA 18-020, Eng. 254, ABERDEEN PROVING GROUND, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. Bids Jan. 22. CD 1/8.

Jas. J. Stehle & Son, 111 Academy St., Annapolis, Md. LB **$374,500**. 2 and 3 story, 33x68 ft., brick, concrete FRIARY addns., near ANNAPOLIS, MD. Capuchin Franciscan Fathers, R.F.D. 2, Annapolis, Md. Bids Jan. 15. CD 1/7.

▲† **Blake Constr. Co. and Wm. T. Lyons Co.**, 110 W. 25 St., Baltimore, Md. LB **$2,272,000**. extensions, alterations to MESS HALL, Bancroft Hall, ANNAPOLIS, MD. P. Wks. Office, U. S. Naval Academy,

(Continued on page 196)

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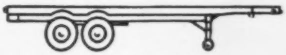
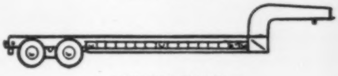
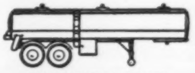
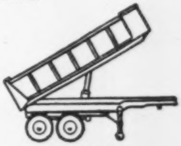
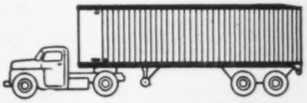

FLAT-BED TRAILER


CARRYALL TRAILER


BULK CEMENT TRAILER


DUMP TRAILER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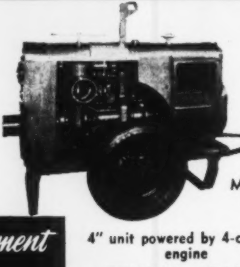

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(Continued from page 194)

Annapolis, Md. Hall, Border & Donaldson, 2517 St. Paul St., Baltimore, Md., archts. Bids Jan. 24. CD 1/4.

The Dundalk Building Co., 900 Court Square Bldg., Baltimore, Md. Owner Builds. **$805,000.** One hundred fifteen 16x32x26 ft., brick block DWELLINGS, 7500 Block Ives Lane, 7500 Block Westfield Rd., near BALTIMORE, MD.

Welsh Homes, Inc., 11 E. Fayette St., Baltimore, Md. Owner Builds. **$441,000.** forty-nine 2 story, 21x35x27 ft. row type, brick HOMES, 1500 block Kennewick Rd., BALTIMORE, MD. Lawrence Menefee, 347 N. Charles St., Baltimore, Md., archt.

Associated Engineers & Constructors, 503 W. 10 St., Wilmington, Del., Separate Contracts. **$750,000.** RESIDENTIAL DEVELOPMENT, CAMDEN, DEL.

Collins Realty Co., 527 Welsh St., Chester, Pa., Separate Contracts, **$300,000,** RESIDENTIAL DEVELOPMENT. Route 113 and Little Creek Rd., DOVER, DEL.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **Ga., Valdosta**—COMMISSARY BLDG—B.A. 2/19—U. S. Eng., Post Office Bldg., Savannah, commissary bldg. at Moody Air Force Base, Inv. 52-45. CD 12/12.

† **N. C., Cherry Point**—SHOP and COLD STORAGE ROOM ADDNS., etc.—B.A. 2/19—At office Resident Officer in Charge of Construction, Marine Corps Air Station, alterations, addns. to commissary butcher shop and cold storage room in Bldg. 162, NOY 29673, Spec. 31373. Plans deposit $10.

† **Va., Norfolk**—B.A. 2/19—Pub. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Zone 11, paving and drainage, at U. S. Naval Supply Center, NOY 71042, Spec. 32829. Plans deposit $10.

† **Va., Norfolk**—STOREHOUSE, etc.—B.A. 2/19—Pub. Wks. office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Zone 11, supply storehouse, NOY 71299, Spec. 32,867; access road to landplane hangar area, NOY 71281, Spec. 32852, at U. S. Naval Air Station. Plans deposit $10 each.

† **W. Va., Charleston**—B.A. 2/19—Dist. P. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va., stabilization of river bank and misc. repairs at U. S. Naval Reserve Training Center, Spec. 3036. Plans deposit $10.

Ala., Birmingham—TERMINAL—B.A. 2/20—City, City Hall, terminal addns. at municipal airport. Van Keuren, Davis & Co., American Life Bldg., archts. Extended date. CD 1/25.

† **Ga., Albany**—ACCESS ROADS, etc.—B.A. 2/20—U. S. Eng., Post Office Bldg., Savannah, Ga., access roads to Navigational Aids Bldg., at Turner Air Force Base, Inv. 52-28. Bids 11/16 rejected. CD 10/18.

† **La., Alexandria**—RUNWAY—B.A. 2/20—U. S. Eng., 300 Broadway, Little Rock, Ark., Job. No. Alexandria A.F.B. A52-1A (Item 1), 8 in. concrete runway exten. approx. 2,800 ft. long, 150 ft. wide, approx. 8,500 ft. 75 ft. wide taxiway, etc. Alexandria Municipal Airport, 8 mi. from here, Rapides Parish, Eng. 03-050-52-26.

S. C., **Gaffney**—B.A. 2/20—City, 47,600 lin. ft. 6- to 14-in. water mains, filtration plant, etc. Plans deposit $50. Harwood Beebe Co., Monttgomery Bldg., Spartanburg, engrs. CD 5/13/46.

† **TENNESSEE**—B.A. 2/20—Bureau P. Rds., Dpt. Commerce Gatlinburg,

Sevier Co.—Proj. 15A1 (culvert) Foothills Parkway, at Norton Creek.

† **Ga., Albany**—B.A. 2/21—Dpt. Navy, Officer in Charge of Construction, Box 365, Naval Base, S. C., furnishing, erecting two 500,000 gal. elevated steel water tanks, at Marine Coprs Depot of Supplies, NOY 70671. Plans deposit $10.

Tenn., **Memphis**—B.A. 2/25—City, City Hall, 4-lane Summer Ave. Parkway to city limits approx. 2½ mi. sidewalks, curbs, asph. topped. $500,000. Wm. Fowler, city engr.

† **La., Alexandria**—RUNWAY—B.A. 2/26—U. S. Eng., 300 Broadway, Little Rock, Ark., Job. No. Alexandria A52-1A (Item 1) runway extension, Alexandria Municipal Airport, Eng. 03-050-52-26. Extended date. CD 1/23.

† **Miss., Gulfport**—GREASE RACK—B.A. 2/26—Dpt. Navy, Officer In Charge of Constr., Box 365, Naval Base, Charleston, S. C., grease rack and service station U. S. Naval Storehouse, NOY 70656. Plans deposit $10.

† **La., Shreveport**—FIRE ALARM SYSTEM—B.A. 2/28—U. S. Eng., 300 Broadway, Little Rock, Ark., fire alarm sys. for 4 dormitories, Louisiana Ordnance Plant, near Minden, Webster Parish, Eng. 03-050-52-31. CD 1/29.

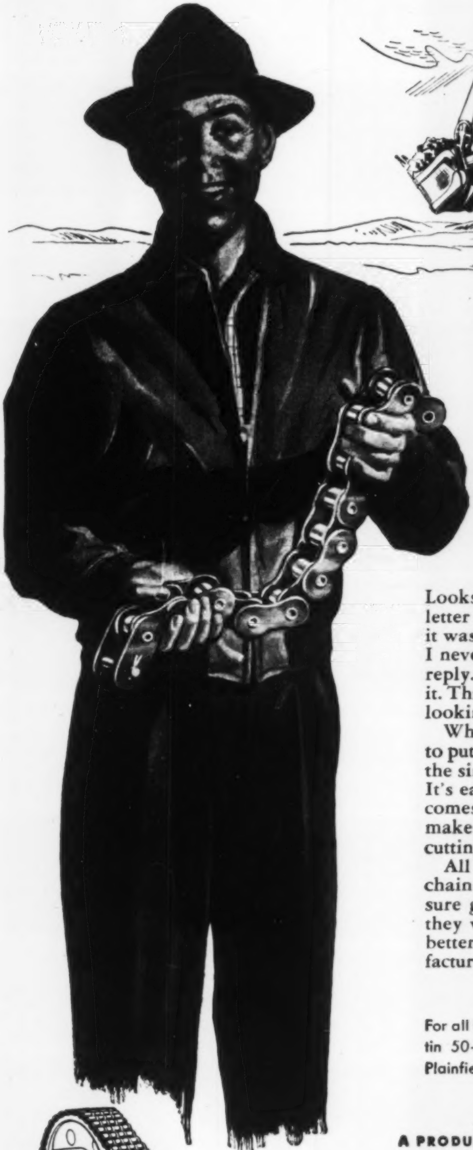
▲ **N. C., Laurinburg**—HOUSING—B.A. 2/28—Ross Shumaker, archt., Box 5445, Raleigh, Housing Projects NC 18-1, 18-2, for Laurinburg Housing Auth., Carl L. Jones, exec.-dir., Laurinburg High School, Laurinburg, N. C. Plans deposit $50. W. B. Griffin, Edwards Bldg., Goldsboro, and Edwards & McKimmon, 743 W. Johnson St., Raleigh, archts.

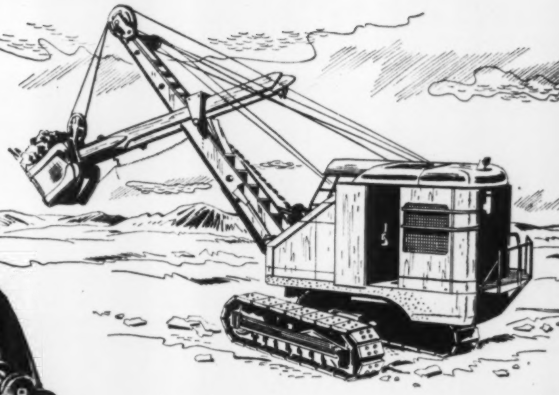
† **TENNESSEE**—B.A. 2/29—Bureau P. Rds., Dpt., Commerce, Gatlinburg,

Blount Co.—Proj. 3C1, Great Smokey Mountains National Park, 0.845 mi. from Tremont Intersection to Park Boundary; adv. ENR 2/14.

† Tenn., **Oak Ridge**—B.A. 2/29—U. S. Atomic Energy Comn., P.O. Box E, Attention: R. J. Dunbar, Engr. & Const. Div., Oak Ridge, resurf. approx. 2.3 mi. Kerr

Continued on page 198)





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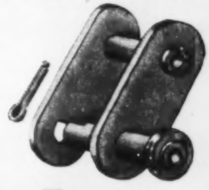

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(Continued from page 196)

Hollow Rd.; approx. 2.7 mi. Bethel Valley Rd.; approx. 3.3 mi. White Wing Bridge Rd. in Oak Ridge Area, Roane and Anderson Counties, Inv. 401-52-7A. Plans deposit $5.

▲† **Ga., Savannah**—BARRACKS, etc.—B.A. 3/12—U.S. Eng., Post Office Bldg., airmens barracks, mess hall, administration bldg., warehouse and telephone bldg. at Hunter Air Force Base, ENG 09-133-52-67. Plans deposit $50.

† **Fla., Eglin Air Force Base**—B.A. After 4/1—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., roads, etc. $750,000. CD 2/20/50.

† **Ala., Selma**—STORAGE FACILITIES, etc.—B.A. After 5/1—U. S. Eng., P. O. Box 1169, Mobile, Zone 7, cold storage facilities and runways at Craig Air Force Base, $500,000. CD 7/18.

BIDS ASKED—BUILDINGS

Ga., Nashville—HOUSING—B.A. 2/19—Nashville Housing Auth., Nashville, housing, Projects GA 92-3 and GA 92-4. Plans deposit $50. L. S. Miller, Box 250, Brunswick, archt. CD 1/21.

Ga., Tallaspoosa—HOUSING—B.A. 2/19—Tallapoosa Housing Auth., Tallapoosa, 45 unit Housing Project GA 97-1, $375,000. Bothwell & Nash, 208 Roswell St., Marietta, archts. CD 1/21.

Fla., Jacksonville—SCHOOL—B.A. 2/20—Bd. P. Instruction, 605 Ocean St., Oaklawn Elementary School and Cafatorium No. 102, $300,000. Plans deposit $25. CD 10/10/49.

† **Ky., Lexington** — AMMUNITION STORAGE FACILITIES—B.A. 2/20—U. S. Eng., 830 W. Broadway, Louisville, Zone 3, addnl. ammunition storage facilities, incl. one hundred 26x81 ft. rein.-con. arch type magazines, grading, crushed stone surf. drives, Blue Grass Ordnance Depot, Eng. 15-029-52-44. Plans deposit $15. CD 9/28.

† **Ala., Fort McClellan**—HOUSING—B.A. 2/21—U. S. Eng., P. O. Box 1160, Mobile 7, Ala., semi-permanent type housing near Anniston, Inv. 52-36. Extended date. CD 12/7.

Ala., Sylacauga — HOUSING — B.A. 2/21 — Sylacauga Housing Auth., Sylacauga, Ala., housing, Project ALA 57-1, incl. 144 units, Plans deposit $50. Chas. H. McCauley Jackson Bldg., Birmingham, archt. CD 6/1.

Ga., Douglasville—HOUSING—B.A. 2/21—Douglasville Housing Auth., Douglasville, housing Projects GA 106-1 and GA 106-2 $300,000. Plans deposit $50. John J. Harte Co., P. O. Box 2192, Atlanta, archts. CD 1/21.

† **Ga., Fort Benning** — SCHOOL — B.A. 2/21 — U. S. Housing & Home Finance Agency, Glenn Bldg., Atlanta, school for children of Fort Benning personnel. $350,000. Plans deposit $30. CD 1/3, under LB.

Ky., Lexington—EMPLOYEE HOUSING—B.A. 2/21—Commonwealth of Ky., Div. Purchases, B. H. Lowry, dir., State Office Bldg., Frankfort, furnishing, labor, material, equip. necessary for constr. 3 employee housing bldgs. at Eastern State Hospital. Plans deposit $10. Kennoy, Cammack & Scott, 601 S. Limestone St., Lexington, engrs. and archts. J. B. Rieman, c/o owner, ch. engr. CD 12/12/50.

Louisiana—SHOP—B.A. 2/21—State Hy. Dpt., Highway Office Bldg., Baton Rouge, 80x40x14 ft., prefabricated steel Sicard Shop Bldg. extension, in Ouachita Parish, S.P. 882-01-05.

La., Lafayette—LIBRARY—B.A. 2/21—Lafayette Parish Police Jury, public library. Plans deposit $20. Dibolls Kessels & Assocs., 637 Pere Antoine Alley, New Orleans, engrs.

La., Oakdale—SCHOOL—B.A. 2/21—Allen Parish School Bd., Oberlin, negro high school. Plans deposit $15, Dunn & Quinn, 1735 South St., Lake Charles, archts. CD 9/18/47.

Tenn., Athens—HOUSING—B.A. 2/22—Athens Housing Auth., Athens, housing units. Plans deposit $50.

La., Abbeville—HOUSING—B.A. 2/23—Abbeville Housing Auth., Abbeville, 76 housing units, $600,000. Plans deposit $50.

N. C., Reynolds—CHAPEL—B.A. 2/25—Wake Forest College, Reynolds, chapel. J. Frederick Larson, Reynolda, archt.

Tenn., Sweetwater—HOUSING—B.A. 2/25—Sweetwater Housing Auth., Sweetwater, housing, Projects Tenn. 16-1 and 16-2, John J. Harte Co., P. O. Box 2192, Atlanta, Ga., archt. CD 9/29/50.

Ala., Tuscaloosa—NURSES HOME—B.A. 2/26—Druid City Hospital, c/o Chas. H. McCauley, archt., Jackson Bldg., Birmingham, nurses home, $500,000. Plans deposit $50. Extended date. CD 1/29.

† **Ky., Camp Breckenridge**—B.A. 2/26—U. S. Eng., 830 W. Broadway, Louisville, Zone 3, two 64x250 ft. warehouses, utilities, Eng. 15-029-52-24. CD 9/28.

Miss., Holly Springs—HOUSING—B.A. 2/26—Holly Springs Housing Auth., Holly Springs, 60 housing units, Projs. Miss. 62-1 and Miss. 62-2, $500,000. Plans deposit $50, John J. Harte, Co., P. O. Box 2192, Atlanta, Ga., archts. CD 1/18.

Tenn., Nashville—HOUSING—B.A. 2/26—Nashville Housing Auth., 700 S. 6 St., 480 unit housing, Tenn. 5-7. Plans deposit $50. CD 9/20.

† **Tenn., Tullahoma**—DISPENSARY—B.A. 2/26—U. S. Eng., Tullahoma, industrial dispensary at Arnold Engineering Development Center. Bids Dec. 12 rejected. CD 11/1.

Ala., Hackleburg—HOUSING—B.A. 2/27—Hackleburg Housing Auth., Hackleburg, housing units. Plans deposit $25. Turner & Northington, Medical Arts Bldg., Florence, archts.

(Continued on page 201)

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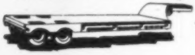
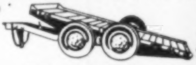
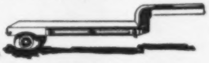


Tandem Axle Trailers



Tandem Axle Tilt Trailers



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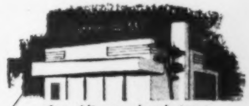

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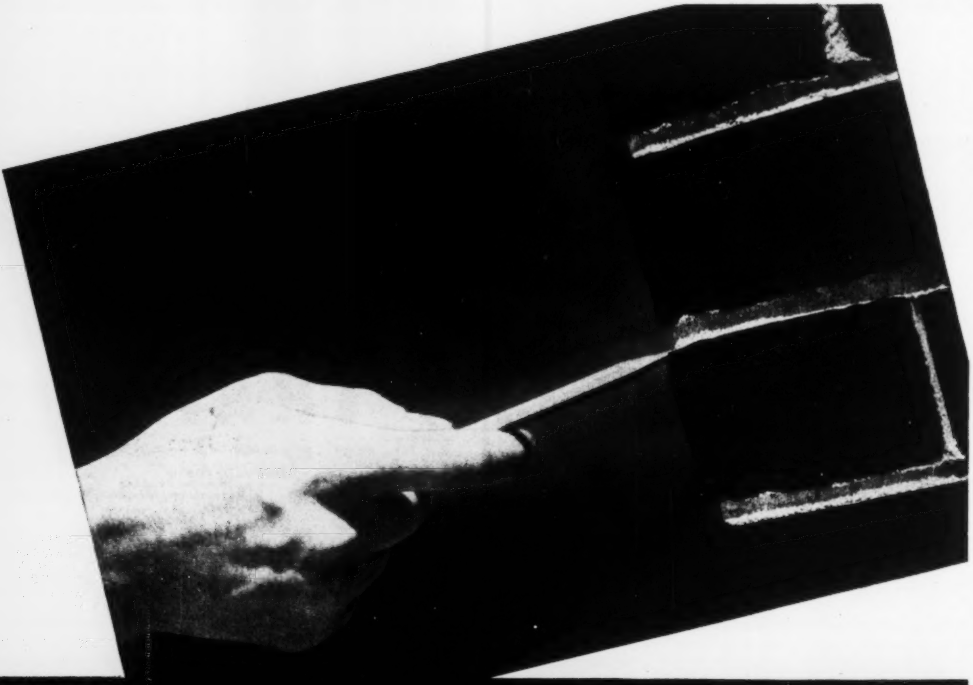

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LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

(Continued from page 198)

Ga., Adel—HOUSING—B.A. 2/27—Adel Housing Auth., Adel, housing, Projects GA 88-1 and GA 88-2 56 units housing, Projects GA-88-1 and GA 88-2, $450,000. Plans deposit $50. John J. Harte Co., 284 Techwood Dr., Atlanta, archts. CD 1/23.

Ga., Eatonton—HOUSING—B.A. 2/27—Eatonton Housing Auth., Eatonton, 50 unit housing, Projects GA 80-3 and GA 80-4, $450,000. Plans deposit $25. Bothwell & Nash, 208 Roswell St., Marietta, archts. CD 1/21.

† **Va., Warrentown**—WAREHOUSE—B.A. 2/27—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., warehouse, operations area at Vint Hill Farm Station, ENG 49-080-52-51-(41). Extended date. CD 1/21.

Ala., Roanoke—HOUSING—B.A. 2/28—Roanoke Housing Auth., Roanoke, Housing Projects ALA 65-1 and ALA 65-2, incl. 50 units. Plans deposit $50. Extended date. CD 1/18.

▲ **Fla., Fort Pierce**—SCHOOL—B.A. 2/28—St. Lucie Co. Bd. P. Instruction, Fort Pierce, White High School $500,000; Colored High School, $500,000. Edgar S. Wortman, 1122 N. Dixie Hy., Lake Worth, archt.

▲ **Ga., Marietta** — HOUSING — B.A. 2/28 — Marietta Housing Auth., Marietta, Project GA 10-4, incl. 125 housing units, $1,000,000. Plans deposit $50. Bothwell & Nash, 208 Roswell St., archts. CD 1/25.

Ala., Tuscaloosa—NURSES HOME—B.A. After 3/1—Druid City Hospital, Tuscaloosa, nurses home. $500,000. Chas. H. McCauley, Jackson Bldg., Birmingham, archt.

La., New Orleans—SCHOOL—B.A. 3/4—Orleans Parish School Bd., 703 Carondelet St., McDonough No. 36 Uptown Negro Elementary School, $900,000. Sol Rosenthal, 630 California Company Bldg., archt.

Ala, Fort Payne—HOUSING—B.A. 3/6—Fort Payne Housing Auth., Fort Payne, housing units. Paul W. Hofferbert, Gadsden, archt.

Fla., Bradenton—HOUSING—B.A. 3/6—Bradenton Housing Auth., Bradenton, 120 housing units, $950,000. Franklin O. Adams, 404 Franklin St., Tampa, archt. Extended date. CD 1/25.

▲ **W. Va., Charleston**—HOUSING—B.A. 3/7—Housing Auth. of City of Charleston, Administration Offices Littlepage Terrace, 1809 Washington St. W., Zone 21, low-rent housing of 500 dwelling units, incl. administration bldg., meter house, bridge, general construction, site imprvt., plumbing, heating, electric wiring, electrical distribution, utilities (sewer, water, gas) lawns, and planting, etc. Proj. W. Va. 1-3. Plans deposit $150. Associated Housing Architects, 316 Davidson Bldg., archts. CD 11/21/50.

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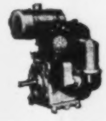
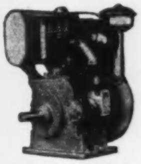
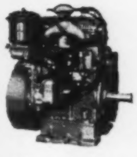


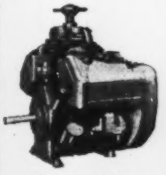
4-Cycle Single Cylinder models, 3 to 6 H.P.



4-Cycle Single Cylinder models, 6 to 9 H.P.



2-Cylinder models, 7 to 13 H.P.



V-type, 4-cylinder models, 15 to 30 H.P.

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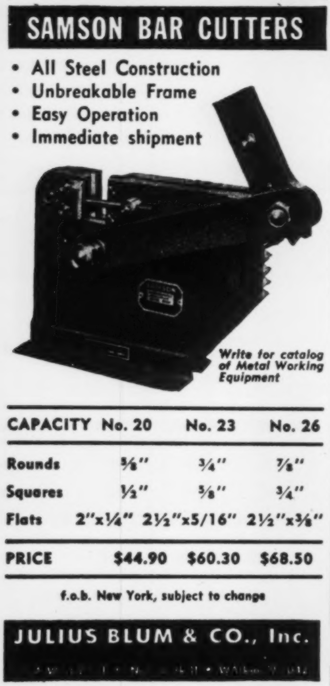
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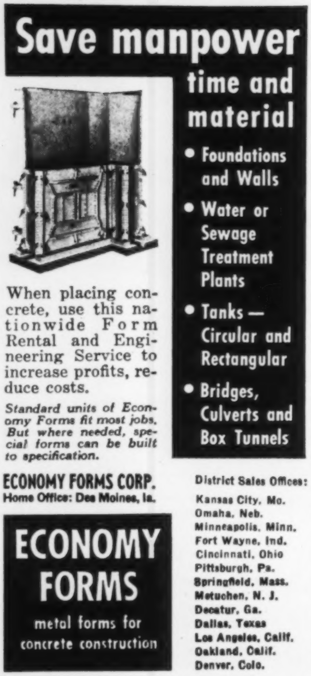
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Oakland, Calif.
Denver, Colo.

Ga., Buford—HOUSING—B.A. 3/12—Buford Housing Auth., Buford, housing, Projects GA 91-2 GA 91-4, 91-5 and 91-6, incl. 84 units. Plans deposit $25. CD 6/23/50.

▲ **Tenn., Memphis**—HOSPITAL—B.A. 5/15—Baptist Memorial Hospital, 899 Madison Ave., 13 story, brick, steel, concrete, 450-bed hospital addn. $5,500,000. Walk C. Jones-Walk C. Jones, Jr., 1215 Poplar Ave., archts. Samuel Hannaford & Sons, Dixie Terminal Bldg., Cincinnati, O., engrs. CD 12/27/50.

SOON LETS CONTRACT—HEAVY CONSTRUCTION

Georgia—TELEPHONE LINES—The Nelson-Ball Ground Telephone Co., Ball Ground, soon lets contract 53 mi. telephone lines. J. B. McCrary Eng. Co., 22 Marietta St. Bldg., Atlanta, engr.

SOON LETS CONTRACT—BUILDINGS

Ga., Hampton—PLANT ADDNS., etc.—Southern States Equipment Co., c/o Moscowitz, Willner & Millkey, archts., 761 Peachtree St., Atlanta, soon lets contract plant addns., alterations. CD 1/30.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

VIRGINIA—State Hy. Dpt., Central Highway Office Bldg., Richmond,

Agnew Constr. Co., Ronceverte, W. Va., LB **$86,053**, 457 ft. bridge and 0.27 mi. approach road Rte. 93 at Walkers Ferry near mouth of Wilson, Grayson Co.;

John P. Harvey, Lynchburg, Va., LB **$61,806**, 158 ft. bridge and approaches Secondary Rte. 705 at Seneca Creek, replacing covered bridge north of Seneca, Campbell Co.;

Steel & Steppe, Rustburg, Va., LB **$74,768**, 6 bridges U.S. 220, south of Boones Mill and Rocky Mount, Franklin Co.;

Ralph E. Mills Co., Inc., 1210 Tennessee St., Salem, Va., LB **$139,901**, 152-ft. bridge and 0.8 mi. approach road U. S. 460 at Little Otter River between Bedford and Lynchburg, Bedford Co. Bids Jan. 29. CD 1/18.

† **VIRGINIA**—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va.

C. H. Lawson, Williamsburg, Va., LB **$120,203**, Proj. 1D13, Colonial Parkway, 0.947 mi. asph. paving through Williamsburg, James City Co. Bids Jan. 17. CD 12/18.

VIRGINIA—State Hy. Dpt., Central Highway Office Bldg., Richmond,

W. W. Tuck, Virgilina, Va., LB **$81,114**, stabil. base, hard surface 3.84 mi. Bickerstaff and Darbytown Rd., between Britton Rd. and Gill Rd., Henrico Co.;

McAmis Bros., North Tazewell, Va., LB **$70,810**, stabil. base, hard surface 2.87 mi. Secondary Rte. 640, from Rte. 82 north of Lebanon northeast to Rte. 654, Russell Co.;

A. B. Burton Co., Inc., Lynchburg, Va., and **E. F. Blankenship Co.**, 1308 Main St. W., Salem, Va., LB **$397,657**, grading, drainage 1.27 mi., c. conc. paving 0.14 mi. U. S. 29 between the James River Bridge and Madison Heights, Amherst Co.;

Faulconer Constr. Co., Charlottesville, Va., LB **$231,236**, stabil. base, macad roadway 3.98 mi. Rte. 56 and U. S. 29 between Shipman and Lovingston, Nelson Co. Bids Jan. 29. CD 1/18.

▲† **MacDonald Constr. Co.**, 1310 S. Grand Blvd., St. Louis 4, Mo., CA, **$4,480,000**, guided missile tracking stations (to be used in conjunction with the long-range proving ground at Cape Canaveral, Fla.) on San Salvador, Mayaguana and Grand Turk Islands, B.W.I. BAHAMA ISLANDS. Bureau Yards & Docks Annex, Navy Dpt., Arlington Va. CD 1/10, under LB, San Salavador.

▲ **NORTH CAROLINA**—State Hy. & Pub. Wks. Comn., Raleigh,

Asheville Paving Co., Box 7068, Asheville, N. C., LB **$250,601**, est. $250,000-$300,000, traffic bound macad. b. conc. binder and surf. 14.71 mi. U. S. 29 and 129, Proj. 9121, Cherokee Co.;

Ballenger Paving Co., Box 1046, Greenville, S. C., LB **$191,838**, est. $150,000-$175,000, PCSBC, sand bit. surf. course 12.34 mi. Proj. 1-9-5-205, Dare Co.;

Blythe Bros. Co., Box 989, Charlotte, N. C., LB **$131,705**, est. $125,000-$150,000. STBC, sand asph. or b. conc. surf. 21.05 mi. Proj. 7-9-62-220, 7-9-62-221, Montgomery Co.; LB, **$114,560**, est. $100,000-$125,000, b. conc. surf. 34.1 mi. Proj. 7-9-61-239, Mecklenburg Co.;

J. F. Cleckley & Co., Orangeburg, S. C., LB **$135,049**, est. $125,000-$150,000, sand asph. or b. conc. surf. 39.2 mi. Proj. 7-9-63-221, Richmond Co.;

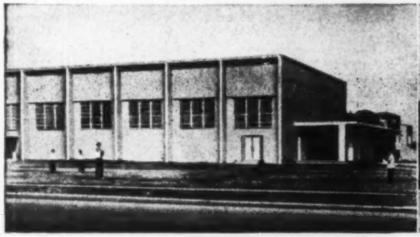
F. D. Cline Paving Co., Box 349, Raleigh, N. C., LB **$66,866**, est. $50,000-$75,000. sand asph. or b. conc. surf. 13.15 mi. Proj. 3-9-29-233, Columbus Co.;

Dickerson, Inc., Box 448, Monroe, N. C., LB **$77,449**, est. $75,000-$100,000, bit. surf. tr. 24.1 mi. Proj. 7-9-61-240, 7-9-66-125, Mecklenburg and Union Counties; LB **$165,106**, est. $150,000-$175,000, bit. surf. tr or sand asph. or b. conc. surf. 50.9 mi. Proj. 7-9-59-219, Anson Co.; LB **$67,328**, est. $50,000-$75,000, traffic bound macad. base course 8.1 mi. Proj. 8-9-75-238, 8-9-75-240, 8-9-75-241, 8-9-75-242, 8-9-75-243, 8-9-76-216, Wilkes and Yadkin Counties;

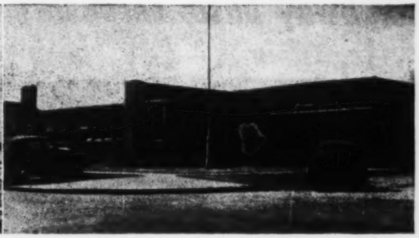
J. E. Dooley, Statesville, N. C., LB **$114,810**, est. $100,000-$125,000, traffic bound macad. base course 15.6 mi. Proj. 8-9-76-218, 8-9-76-219, 8-9-76-220, 8-9-76-222, BS 8-7-76-27, Yadkin Co.;

Gilbert Eng. Co., Statesville, N. C., LB **$139,218**, est. $150,000-$175,000, STBC, traffic bound macad, bit. surf. tr. or b. conc. surf. 13.2 mi. Proj. 9-9-80-223, 9-9-81-221, Cleveland and Gaston Counties; LB **$529,983**, est. $400,000-$500,000, grading 17.88 mi. Proj.

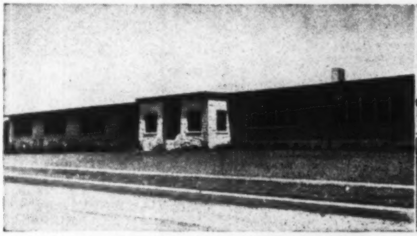
(Continued on page 204)



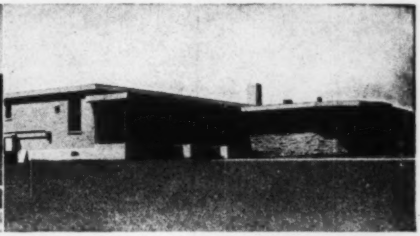
Benjamin K. Wyatt, architect, specified Stran-Steel Framing in the construction of Robstown High School Gym, Robstown, Texas.



Stran-Steel Framing was used in walls, roof and partitions in the St. Elizabeth School, Alice, Texas. Wade, Gibson & Martin, architects.

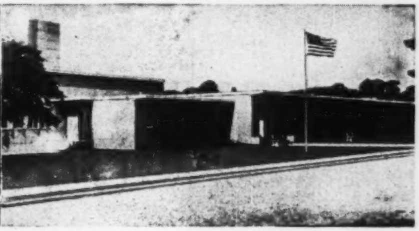


In San Antonio, the Esther Perez Carvajal School is constructed of Stran-Steel Framing. Percy W. and J. Clyde Williams, architects.



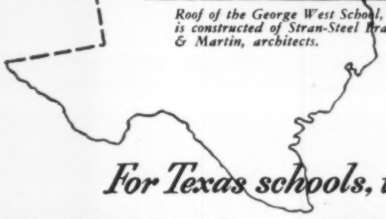
The James Madison Elementary School, San Antonio, Texas, is built around Stran-Steel Framing. Phelps, Dewees & Simmons, architects.

Roof of the George West School, George West, Texas, is constructed of Stran-Steel Framing. Wade, Gibson & Martin, architects.



The W. J. Knox Elementary School, San Antonio, is another example of widespread use of Stran-Steel Framing. Benjamin K. Wyatt, architect.

STRAN-STEEL
REG. U. S. PAT. OFF.



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(Continued from page 202)

6559, U-680 (9), F-680 (10), F-680 (11), Mecklenburg and Union Counties;

W. E. Graham & Sons, Cleveland, N. C., LB **$62,099**, est. $75,000-$100,000 grading 2.2. mi. Proj. 7409, F-191 (6), Forsyth Co.; LB **$86,670**, est. $75,000-$100,000, traffic bound macad. base course 11.5 mi. Proj. 8-9-73-224, 8-9-73-225, 8-9-73-226, 8-9-73-229, 8-9-73-230, Surry Co.;

Kerr Sand Co., Hickory, N. C., LB **$112,018**, STBC, bit. surf. tr. and b. conc. 12.54 mi., Proj. 9-9-79-220, Catawba Co.;

Ray D. Lowder, Inc., Albemarle, N. C., LB **$223,049**, est. $225,000-$250,000, traffic bound macad., bit. surf. tr. 8.77 mi., N. C. 742, Proj. 6085, S-245 (2), Anson, Union and Stanly Counties;

Propst Constr. Co. Inc., Concord, N. C., LB **$138,876**, est. $150,000-$175,000. STBC, bit. surf. tr. 36.5 mi. Proj. 7-9-64-234, Rowan Co.;

H. F. Ramsey Co., Inc., Asheville, N. C., LB **$510,680**, est. $400,000-$500,000. Traffic bound macad., bit. surf. tr. 10.7 mi. Proj. 8162, F-348 (2), Burke Co.;

E. B. Towles Constr. Co., Wilmington, N. C., LB **$110,264**, est. $75,000-$100,000, traffic bound macad., b. conc. binder and surf. 3.9 mi. Proj. 3-9-32-218, New Hanover Co.;

Wayne Eng. & Constr. Co., Mt. Olive, N. C., LB **$186,257**, est. $200,000-$225,000, STBC or PCSBC and bit. surf. tr. or sand asph. or b. conc. surf. 6.78 mi. Proj. B.S. 4-7-38-50, Wake Co.; LB **$169,672**, est. $200,000-$225,000, STBC, bit. surf. tr. or sand asph. or b. conc. surf. 12.1 mi. Proj. 4-9-38-234, Wake Co. Bids Jan. 29. CD 1/18.

NORTH CAROLINA—State Hy. & Pub. Wks. Comn., Raleigh,

F. A. Triplett, Inc., Chester, S. C., LB **$462,014**, 2 bridges, N.C. 24, Proj. 3696, AD-AF-1, Onslow and Carteret Counties; LB **$201,968**, structures on 17.58 mi. Proj. 6559, U-680 (9), F-680 (10), F-680 (11), Mecklenburg and Union Counties;

Wilson Constr. Co. Inc., Box 603, Salisbury, N. C., LB **$127,498**, est. $125,000-$150,000, 2 bridges, Proj. No. 5007, Alamance Co.; LB **$67,128**, est. $25,000-$50,000, structures, 0.98 mi. Proj. 6-162, S-299 (2), Davidson and Rowan Counties; LB **$125,569**, est. $125,000-150,000, structure, Proj. No. 5-9-42-205, Alamance Co.;

A. R. Thompson, Contractor, Inc., Rutherfordton, N. C. LB **$63,952**, est. $75,000-$100,000, bridge and approaches N.C. 108, Proj. 8661, F-9 (10), Polk Co.;

John H. Brinkley, Thomasville, N. C., LB **$141,994**, est. $175,000-$200,000, structures on 10.7 mi. Proj. 8162 F-348 (2), Burke Co. Bids Jan. 29. CD 1/18.

Boyd & Goforth, Pineville Rd., Charlotte, N. C. CA. **$178,814**, WW imprvs., LANDIS, N. C. Town, Landis, N. C. Bids Jan. 22. CD 1/16.

† **Norfolk Dredging Co.**, Campostella Wharf, Norfolk, Va., LB **$181,251**, maintenance dredging in Georgetown

(Continued on page 206)

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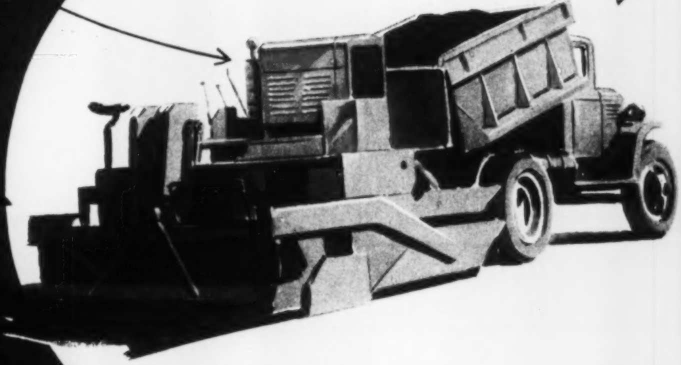

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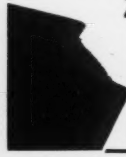

2. Explains business methods that make home building more profitable. Gives a practical understanding of the economic factors determining the market for your product. Covers every important aspect from preparing a project-site, to selling the finished building. **By B. K. Johnstone, Carnegie Inst. of Tech., and C. E. Joern, Wm. Joern and Sons. 289 pages, 174 illus., $4.50**

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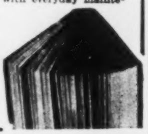

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(Continued from page 204)

Harbor, Georgetown Co., Serial No. CIVENG 38-081-52-7. SOUTH CAROLINA. U. S. Eng., Customhouse, Charleston, S. C. Bids Jan. 29. CD 1/4.

Meador Constr. Co., Harris St. N. W., Atlanta, Ga., CA, **$104,000**, sidewalk imprvs., ATLANTA, GA. City, City Hall, Atlanta, Ga. Bids Jan. 28. CD 1/18.

Wright Contg. Co., 504 25 Ave., Columbus, Ga., CA, Approx. **$500,000**, runway paving, MARRIETTA, GA. Lockheed Aircraft Corp., Marietta, Ga.

† **Triangle Constr. Co.**, P. O. Box 997, Tallahassee, Fla., CA, **$160,644**, clearing, grading and drainage for airmens' quarters at EGLIN FIELD, FLA. U. S. Eng., P. O. Box 1169, Mobile 7, Ala. Bids Jan. 23, awarded Jan. 25. CD 12/31.

▲ † **Atlantic, Gulf & Pacific Co.**, 15 Park Row, New York, N. Y., LB, **$1,360,000**, dredging at Boca Chica Field and Naval Station, NOY 70678, KEY WEST, FLA. Dpt. Navy, Officer in Charge of Construction, Box 365, Naval Base, S. C. Bids Jan. 24. CD 12/28.

Joseph Mann, 930 Everglades Concourse, Miami Beach, Fla., CA, **$75,000**, 600,000 gal. sewage treatment plant, HOMESTEAD, FLA. City, Homestead, Fla. Bids Jan. 14.

Joe Reinertson, 2027 N.W. 7 Ave., Miami, Fla., LB **$641,316**, sewerage system and disposal plant, MADEIRA BEACH, FLA. City, Madeira Beach, Fla. Bids Jan. 21. CD 1/15.

Chicago Bridge & Iron Co., 57 Forsyth St., Atlanta, Ga., LB, **$145,975**, Reservoir No. 1, MIAMI BEACH, FLA. City, c/o Water Dpt., City Hall, Miami Beach, Fla. Bids Jan. 28. CD 1/17.

† **Paul & Son**, 921 Ortega Rd., West Palm Beach, Fla., LB, **$111,900**, rehabilitation of 11 buildings, International Airport, WEST PALM BEACH, FLA. U. S. Eng., P.O. Box 4970, Jacksonville, Fla. Bids Jan. 25. (Correction—cost). CD 1/30. under LB.

MISSISSIPPI—State Hy. Comm., Jackson,

Jerry G. Alexander Co., Hattiesburg, Miss. CA **$104,295**, est. $97,000. double bit. surf. 8.455 mi. Miss. Hy. 26 between Wiggins and Lucedale, F 282 (8), Stone Co.

Cobb Bros. Constr. Co., Citizens Bank Bldg., Meridian, Miss. CA **$59,556**, est. $56,000, grading, culverts, double bit. surf. tr. 2.848 mi. Miss. Hy. 552 between Lormon and Red Lick, S 352 (1), Jefferson Co.

W. L. Wells, 525 Mitchell Ave., Jackson, Miss. CA **$63,697**, est. $63,000, grading, drainage, culverts 3.635 mi. Miss. Hy. 306 between Independence and Coldwater, SP 306-1548 (1), Tate Co.;

Hyde Constr. Co., Hy. 80 W., Jackson, Miss. CA **$181,795**, est. $167,000, double bit. surf. tr. 9.262 mi. Miss. Hy. 1 between Miss. Hy. 14 and Hampton, F 043-1 (2), Isaquena and Washington Counties. Grand total $409,343. Bids Jan. 29. CD 1/23 and 1/21.

† **Hyde Constr. Co.**, P. O. Box 385, Jackson, Miss. CA **$999,939**. taxiway, roads, parking areas, gas, water and sanitary sewerage sys., etc., Inv. 52-21,

(Continued on page 208)

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IN 2
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1 At overflow rates of 5000 to 7500 gal./sq. ft./24 hrs., the Vacuator can serve as a complete pre-treatment unit, removing scum, grit and a substantial percentage of suspended solids—also thickening excess secondary sludges.

EXAMPLE:

At McAlester, Oklahoma's new West Sewage Treatment Plant a 12' dia. Vacuator removes scum, grease and grit from incoming screened sewage, prior to two-stage trickling filter treatment. Operating results show removals of 46.6% of suspended solids and a 28.4% reduction in B.O.D.

AS A SCUM-REMOVAL UNIT

2 At overflow rates of 5000 gal./sq. ft./24 hrs., the Vacuator can be used for the treatment of oil, cannery, packing house, laundry and similar tough-to-handle wastes.

EXAMPLE:

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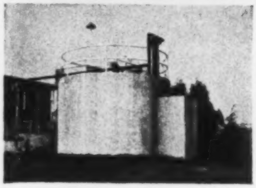
3 Overflow rates as high as 10,000 gal./sq. ft./24 hrs. can be used when the primary function of the Vacuator is grease removal from domestic or industrial wastes.



EXAMPLE:

At Patuxent River, Maryland, a 14' dia. Vacuator removes heavy "slug loads" of grease ahead of primary treatment. Removals average 50% of suspended solids and a 51% reduction in B.O.D., enabling the standard Dorr Clarifier which follows to function smoothly without auxiliary equipment.

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(Continued from page 206)

Keesler Air Force Base, BILOXI, MISS. U. S. Eng., P. O. Box 1169, 2301 Grant St., Mobile 7, Ala. CD 11/29, under LB.

Hunt Oil Co., 4011 Essex Lane, Houston, Tex. Owner Builds, **$85,000.** 10 mi. 4 in. crude oil pipe line, Haynesville, LOUISIANA.

A. N. Goldberg Constr. Co., Maison Blanche Bldg., New Orleans, La. CA **$64,972.** c. conc., asph. paving subsurf. drainage on Proposals No. 19,938 to 19,943, NEW ORLEANS, LA. City, c/o Purchasing Agent, City Hall, New Orleans, La. Bids Jan. 18, awarded Jan. 25. CD 5/3/51.

† **Campbell Constr. Co.**, P.O. Box 1758, Shreveport, La. LB **$124,556**, Item 1;

Geo. W. McCoy & Co., P.O. Box 10121, New Orleans, La. LB **$105,563**, Item 2. repairs to railroad trackage, Spec. No. 32937, NEW ORLEANS, LA. Officer-In-Charge-Constr., Naval Station, Bldg. 16, New Orleans, La. Bids Jan. 23. CD 1/9, under LB.

F. D. Harvey, Falls Bldg., Memphis, Tenn., LB **$77,844**, installing sanitary sewers, Prospect Park area, MEMPHIS, TENN., City, City Hall, Memphis, Tenn. CD 2/7/51.

BUILDINGS

LOW BIDS AND CONTRACTS

John P. Pettyjohn & Co., Norfolk, Va., CA. Approx. **$300,000.** STORAGE bldg. and pier, NORFOLK, VA. Norfolk & Western Ry. Co., A. B. Stone, ch. engr., General Office Bldg., Roanoke, Va. CD 10/22.

Thorington Constr. Co., 205 E. Canal St., Richmond, Va., CA. **$630,000.** SCHOOLS at Newbern, Hiwassie, Snowville and Draper, PULASKI, VA. Pulaski Co., Pulaski, Va. CD 1/24, under LB.

Allen-Garcia, 332 S. Michigan St., Chicago, 4, Ill., CA, **$500,000**, design and construct, crushers, conveyors, stone handling FACILITIES, TRIADELPHIA, W. VA. Valley Camp Coal Co., Western Reserve Bldg., Cleveland, O. Awarded Jan. 11. CD 10/4.

Clarence Mobley Constr. Co., 640 11 St., Augusta, Ga., CA, **$397,600**, VOCATIONAL bldg., AUGUSTA, GA. Richmond Academy Bd. Trustees, Walton Way, Augusta, Ga.

Wigton Abbott Corp., 1225 South Ave., Plainfield, N. J., CA, Approx. **$500,000,** tire cord PLANT, CARTERSVILLE, GA. Goodyear Tire & Rubber Co., Cartersville, Ga. Bids Dec. 3. CD 11/27.

James G. Wright, Dawson, Ga., Owner Builds, **$82,000,** HOSIERY MILL, DAWSON, GA.

Flagler Co., 305 Techwood Dr., Atlanta, Ga., CA, Approx. **$150,000,** WAREHOUSE, DECATUR, GA. Georgia Power Co., Marietta St. N. W., Atlanta, Ga. Bids Jan. 15. CD 1/2.

† **U. S. Eng.**, Post Office Bldg., Savannah, Ga., cancelled bids to have been opened Feb. 5, ENGINEER SHOP and CLASSROOM BLDG., ENG 09-33-52-55, FORT BENNING, GA. CD 1/11.

Joylan Corp., P. O. Box 386, Hapeville, Ga. Owner Builds, **$300,000,** RESIDENTIAL DEVELOPMENTS, HAPEVILLE, GA.

City, Bd. of Educ., Rossville, Ga., rejected bids Jan. 8, high SCHOOL, ROSSVILLE, GA. L. B. **$445,000.** CD 1/14, under LB.

Jack B. Wonderlin, 7424 S. W. 54 Ave., Miami, Fla., Owner Builds, **$82,000,** mfg. PLANT, HIALEAH, FLA.

O. P. Woodcock Co., 430 W. Monroe St., Jacksonville, Fla. LB, **$317,816,** Dinsmore SCHOOL, JACKSONVILLE, FLA. Bd. P. Instruction, 605 Ocean St., Jacksonville, Fla. Bids Jan. 23. CD 12/28.

Fred Homes, c/o Southeastern Builders, 1750 S. W. 3 Ave., Miami, Fla., CA, **$350,750**, 50 RESIDENCES, MIAMI, FLA.

Marvel Constr. Co., 2848 N. W. 27 Ave., Miami, Fla., Owner Builds, **$300,000,** RESIDENTIAL DEVELOPMENTS, MIAMI, FLA.

Milton S. Freberg, 4106 Santa Maria St., Coral Gables, Fla., CA, Approx. **$85,000,** PRINTING PLANT, MIAMI, FLA. Miami Post Publishing Co., c/o H. S. Savage, archt., 3008 Coral Way, Miami, Fla.

J. P. Kulzer, Ormond Beach, Fla., Owner Builds, **$350,000.** RESIDENTIAL DEVELOPMENT, ORMOND BEACH, FLA.

L. L. Shiles & Son, Ormond Beach, Fla., Owner Builds, **$300,000** RESIDENTIAL DEVELOPMENTS, ORMOND BEACH, FLA.

Dobbins Bros., 218 N. 21 St., Birmingham, Ala., Owner Builds, **$750,000,** 90 RESIDENCES, Greensprings Rd., BIRMINGHAM, ALA.

J. F. Holley, 905 6 Ave. N., Birmingham, Ala., CA, **$729,945**, CHURCH, BIRMINGHAM, ALA. Hunter Street Baptist Church, c/o Geo. P. Turner, archt., American Life Bldg., Birmingham, Ala. Bids Nov. 7. CD 11/13, under LB.

Currie & Corley, Raleigh, Miss. CA **$375,000.** HOUSING units, BILOXI, MISS. Cowan Road Homes, Inc., c/o contractor.

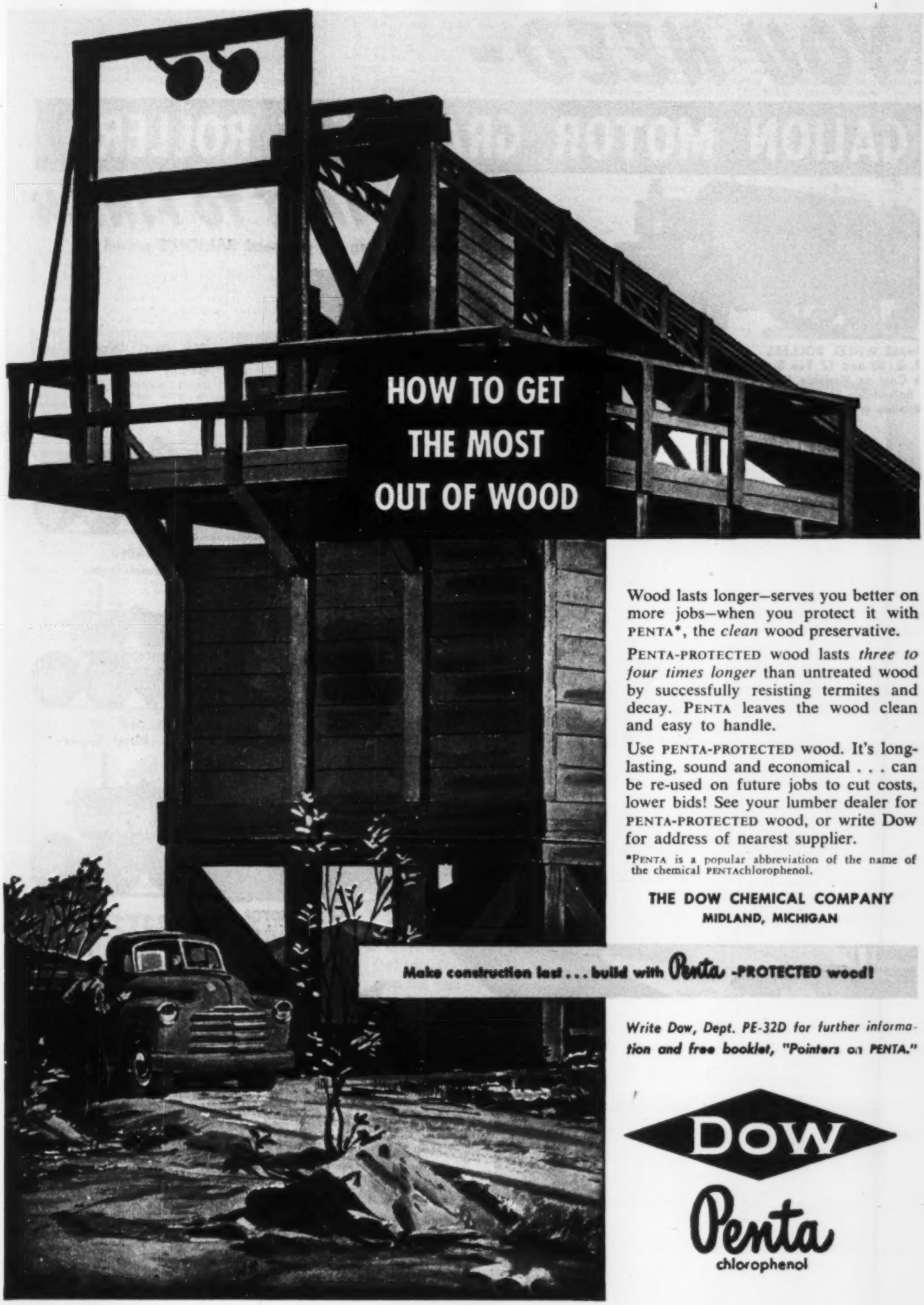
Stanley W. Newman Co., P.O. Box 1565, Mobile, Ala. CA **$391,300.** 49 HOUSING units, Proj. Miss 5-6, BILOXI, MISS. Biloxi Housing Auth., Biloxi, Mass. CD 1/18.

Carnf Corp., E. Railroad Ave., Brookhaven, Miss. Owner Builds. **$85,000.** FACTORY, BROOKHAVEN, MISS. Bids Dec. 31. CD 12/31.

G. E. Bass & Co., P.O. Box 1033, Jackson, Miss. CA **$575,444.** SANATORIUM bldg. at East Mississippi State Hospital, MERIDIAN, MISS. State Bldg. Comm., Jackson, Miss. CD 11/17/48.

Gentilly Homes, Inc., 4210 Press Dr., New Orleans, La. Owner Builds. **$500,000.** 56 RESIDENCES, NEW ORLEANS, LA.

(Continued on page 211)



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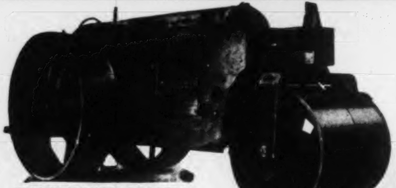

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6, 7, 8, 10 and 12 Ton Sizes
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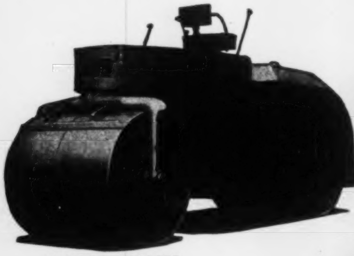
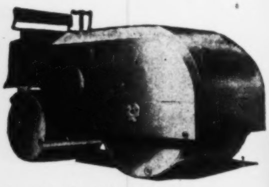
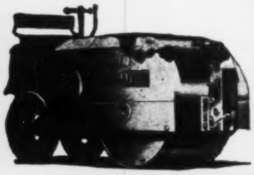
Ballastable Steel Rolls
Gasoline or Diesel Engines



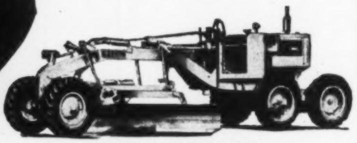
TANDEM ROLLERS
Variable Weight -- 5-8, 8-12, and 10-14 Ton Sizes
Gasoline or Diesel Engines



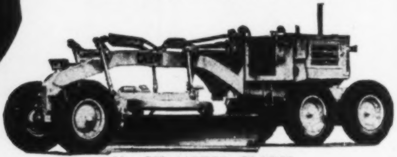
SMALL TANDEM ROLLERS
Variable Weight -- 3-5 Ton
Gasoline Engine



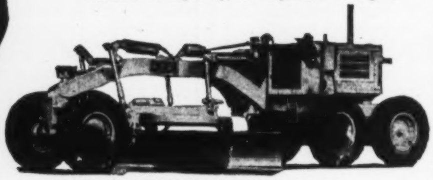
PORTABLE ROLLER
Variable Weight - 7100-9765 lbs.
Gasoline Engine



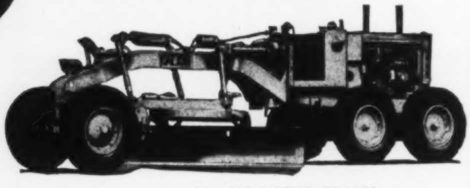
No. 303 MOTOR GRADER
Medium-Duty, 50 h.p. Diesel Engine



No. 203 MOTOR GRADER
Medium Heavy-Duty, 70 h.p. Diesel Engine



No. 104 MOTOR GRADER
Heavy-Duty, 76 h.p. Diesel Engine



No. 118 MOTOR GRADER
Extra Heavy-Duty, 100 h.p. Diesel Engine

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Schill-Wolfson, 2600 Poydras St., New Orleans, La. CA $350,000. 46 RESIDENCES, NEW ORLEANS, LA. Northside Homes, Inc., c/o contractor.

Haase Constr. Co., 822 Perdido St., New Orleans, La. CA $300,000. CHURCH, NEW ORLEANS, LA. Grace Episcopal Church, 1501 Canal St., New Orleans, La. CD 7/12.

T. Miller & Sons, Lake Charles, La. CA $470,111. 70 HOUSING units, OAKDALE, LA. Oakdale Housing Auth., Oakdale, La. Bids Jan. 24. CD 1/3.

▲ Whittenberg Constr. Co., 2214 Floyd St., Louisville, Ky. CA $4,250,000. fourteen 1-bed room HOUSING units, two hundred and fifteen 2-bed room HOUSING units, forty-five 3-bed room HOUSING units, ELIZABETHTOWN, KY. H. G. Whittenberg, 2214 S. Floyd St., Louisville, Ky. Awarded Dec. 17. CD 12/31, under Lb.

Glazer Steel Corp., 2100 Ailor Ave., Knoxville, Tenn. LB $139,483. structural steel for R.E.A. generating PLANT, FORD, KY. East Kentucky Rural Electric Co., Operative Corp., Winchester, Ky. Bids Jan. 30.

† Gilson Constr. Co., 757 E. 3 St., Lexington, Ky. LB $253,992, est. $259,522. FIRE STATION, CABLE PROCESSING and SALVAGE BLDGS., site grading, roads, etc., Lexington Signal Depot, LEXINGTON, KY. U. S. Eng., 830 W. Broadway, Louisville 3, Ky. Bids Jan. 29. CD 12/6.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

Ind., **Fort Wayne**—B.A. 2/19—Bd. P. Wks., City Hall, two elevated 1 m.g. water storage tanks, one for southeast section and other for southwest section. Drury, McNamee & Porter, Ann Arbor, Mich., engrs. CD 2/4/49.

† O., **Columbus**—ROADS and DRAINS—B.A. 2/19—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., roads and drains at Lockbourne Air Force Base, Eng 46-002-52-95. Plans deposit $5. CD 12/28.

O., **Columbus**—B.A. 2/19—City, City Hall, Hudson Street and others, reconstruction program. $300,000. Robert F. Werner, city engr. CD 1/18/45.

Wis., **Cameron**—B.A. 2/19—Village, 20,845 ft. 8 and 10 in. sanitary sewers and sewage treatment plant. $235,000. Plans deposit $15. Banister Eng. Co., 1547 University Ave., St. Paul, Minn., engrs. CD 12/4.

Mich., **Chelsea**—B.A. 2/20—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, 7,385 cu. yd. grading, drainage structures, 0.59 mi. of road, 2 acre parking, Big Portage Lake section, Waterloo State Recreation area. Plans deposit $3 no refund.

† **Illinois**—B.A. 2/21—U. S. Eng., 834 U. S. Court House & Custom House, 1114 Market St., St. Louis, 1, Mo., constr. 8,965 lin. ft. levee and double 72 in. gravity drainage structure, Prairie Du Rocher, and vicinity, Proj. Item IV-B (Edgar Lakes & Prairie Du Rocher & Modoc Drainage and Levee Districts, Randolph Co., CIVENG 23-065-52-61. CD 4/27/44.

† O., **Dayton**—APRON—B.A. 2/21—U. S. Eng., 830 W. Broadway, Louisville, Ky., concrete apron for fighter aircraft, totaling 25,000 sq. yd. at Wright-Patterson Air Force Base. CD 9/27.

† Mich., **Kinross**—HANGAR, etc.—B.A. 2/26—U. S. Eng., 1900 Cadillac Tower, Detroit, Zone 26, 116x175 ft. maintenance hangar and 3 shop wings, Kinross Air Forve Auxiliary Field. CD 8/29, under Mich., Sault Ste. Marie.

† Mich., **Kinross**—REFUELING FACILITIES—B.A. 2/27—U. S. Eng., 1900 Cadillac Tower, Detroit, Zone 26, refueling facilities, Kinrose Air Force Auxiliary Field. CD 8/29, under Mich., Sault Ste. Marie.

† Wis., **Madison**—TAXIWAY EXTEN.—B.A. About 3/1—U. S. Eng., 428 Federal Bldg., Milwaukee, Zone 1, taxiway extension at Truax Air Force Base, Inv. No. ENG 47-031-52-11. CD 6/27.

Ill., **Glencoe**—B.A. 3/13—At Office H. B. Bray, village clk., Village Hall, WW imprvs., incl. (A), structures and piping, (B), mixing equipment, (C), filter equipment, (D), pumping equipment. Plans deposit $25, Contr. A; $10 for Contr. B; $20 for Contr. C and $5 for Contr. D. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Zone 6, engrs.; adv. ENR 2/14.

Mich., **Boyne City**—PIPE COVERING—B.A. 3/19—Northern Michigan Electric Co-operative, Boyne City, Sect. 9, pipe covering and equipment insulation. Stanley Engineering Co., Hershey Bldg., Muscatine, Ia., engr. CD 12/29/49, under Michigan.

BIDS ASKED—BUILDINGS

Ill., **Bellwood**—SCHOOL—B.A. 2/19—St. Simeons Parish, 507 Bellwood Ave., 2 story, bsmnt. school addn., $300,000. Fisher & Bryant, 79 W. Monroe St., Chicago, Zone 3, archts. CD 1/23.

Ind., **Fort Wayne**—SCHOOL—B.A. 2/19—William E. Miller, trustee, St. Joseph Twp., Fort Wayne, grade school addn. to present consolidated school. Plans deposit $25. LeRoy Bradley, 1115 S. Clinton St., archt.

† Ind., **Jeffersonville**—SHOP—B.A. 2/19—U.S. Eng., 830 W. Broadway, Louisville 3, Ky., parachute repair shop, Jeffersonville Quartermaster Depot, Serial No. Eng 15-029-52-19. Extended date. CD 12/6.

Mich., **Kalamazoo**—SCHOOL—B.A. 2/19—Kalamazoo Twp., Bd. Educ., C. C. Crawford, secy., 2 story, bsmnt., brick, steel Northeast Junior High School, $300,000. Louis C. Kingscott & Assoc., Inc., 511 Monroe St., archt. CD 12/18/50.

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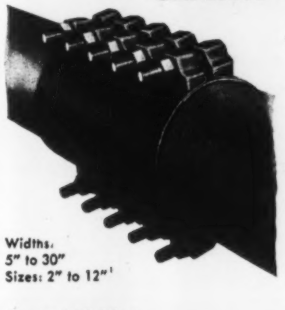

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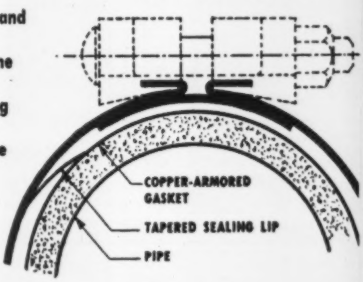

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Mich., Kalamazoo—POWER PLANT—B.A. 2/20—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, power plant imprv., constr. electrical distr. sys., second sect. Kalamazoo State Hospital, Fargo Engineering Co., 120 W. Michigan Ave., Jackson, engr. CD 3/13/51.

O., Akron—SCHOOL—B.A. 2/21—Bd. Educ., 70 N. Broadway, Howe School addns., alterations, 570 W. Bowery St. J. A. Fichter & H. A. Brooker, 706 Crosby St., archts. CD 7/25.

O., Fairborn—HIGH SCHOOL—B.A. 2/21—Bd. Educ., Fairborn City School Dist., N. Central Ave., partial 1 story, 2 story high school. Plans deposit $20. Walker, Norwich & Assoc., 12 W. Monument Ave., Dayton, archts.-engrs. CD 6/26.

O., Akron—HIGH SCHOOL—B.A. 2/25—Bd. Educ., 70 N. Broadway, Simon Perkins Junior High School, Mull Ave. and Kildare Rd. Plans deposit $35. M. M. Konarski, 844 W. Market St., assoc. archt. Edwin F. Bliss, c/o owner, archt. CD 9/7.

▲† **Ind., Camp Atterbury**—HOUSING—B.A. 2/28—Public Housing Admin., 201 N. Wells St., Chicago, Ill., 140 two-bedroom houses, fifty 3-bedroom housing. 1 and 2 story, frame temporary housing, site imprvs., roadways, sewers and water distr. sys. $1,500,000. Plans deposit $25. A. M. Strauss, Strauss Bldg., Fort Wayne, Zone 2, archt.

Mich., Hartford—SCHOOL—B.A. 2/28—Hartford Twp., E. M. Smith, secy. Hartford School Dist., brick, masonry school. $300,000. Maurer & Maurer, 312 Lafayette Bldg., South Bend, Ind., archts.

Ind., Evansville — SCHOOL — B.A. 2/29 — Bd. School Trustees, O. H. Roberts, chn., 200 N. W. 7 St., brick Vogel School, $300,000. Plans deposit $25. Ralph Legeman, 10 Chestnut St., archt. CD 12/20/43.

Ind., Kokomo—SCHOOL—B.A. About 3/1—School City, F. L. Roe, Buildings Supt., Kokomo, school in Pettis Dist. $600,000. Beine, Hall & Curran, 607 Broadway, Gary, archts. CD 12/20.

Mich., Wyandotte—SCHOOL—B.A. 3/3—Bd. Educ., 540 Eureka Rd., brick, concrete Woodruff Elementary School addn., St. Johns St. $300,000. Plans deposit $20 refundable. Carlton P. Campbell, 2903 Biddle St., archt.

▲ **Ind., Indianapolis**—HOUSING—B.A. 3/4—Housing Auth. of Indianapolis, D. R. Hanson, dir., 11 W. 28 St., Zone 11, low-cost housing, Project IND 17-4, incl. 88 dwellings; Proj. 17-1, 260 dwellings all 1 and 2 story frame, $1,000,000. Plans deposit $50. Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., archts. McGuire & Shook, 1400-01 Fletcher Trust Bldg., Zone 4, and R. F. Daggett & Assoc., 350 E. Fall Creek Blvd., N. Drive, Zone 5, assoc. archts. CD 4/2.

Ill., Dixon—DWELLING UNITS—B.A. 3/4—Lee County Housing Auth., W. H. Badger, secy.-treas., Council Room, Dixon City Hall, 76 dwelling units and management bldg. on site for Project Ill. 35-1 and about 2½ mi. away 4 dwelling units on site Proj. Ill. 35-2, etc. Plans deposit $50. J. Fletcher Lankton-John N. Ziegele & Assoc., 1100 Main St., Peoria, Ill., archts. CD 10/2/50.

▲ **Ill., Chicago**—HOUSING—B.A. 3/6—Chicago Housing Auth., 608 S. Dearborn St., Chicago, Zone 5, 4 apartments, 15 story, incl. 648 units, Addams-Brooks Project, 14 and Laflin Sts. $6,000,000. Shaw, Metz & Dolio, 208 S. La Salle St., Zone 4, archts. CD 8/9.

Ill., East Moline—DWELLING UNITS—B.A. 3/11—Rock Island County Housing Auth., W. Dale Chambers, exec. dir., Administration Bldg., 34 dwelling units for Project Ill. 10-2 and approx. ½ mi. away 16 dwelling units and maintenance bldg. for Proj. Ill. 10-3. Plans deposit $50. J. Fletcher Lankton-John N. Ziegele & Assocs., 110 Main St., Peoria, Ill., archts.

SOON LETS CONTRACT—BUILDINGS

Ill., Chicago—SCHOOL—Our Lady's Mission Parish, Corliss and 133 Sts., soon lets contract 1 story, steel, concrete brick school $375,000. Edo J. Belli, 8 S. Dearborn St., Chicago, Ill., archt. CD 11/12.

▲ **Ind., Gary**—HOUSING—Dorie Miller Homes, N. 21 St., east of Mississippi St., soon lets contract 200 unit, two story, 26x86 ft. and 26x109 ft. frame housing. $2,650,000. Plans deposit $50. Beine, Hall & Curran, 607 Broadway, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **INDIANA**—State Hy. Comn., State House Annex, Indianapolis, Zone 4,

Meitz, Spear & Dehner, 1212 Clark St., Fort Wayne, Ind., LB, **$543,144**, est. $617,104, conc. base wid'n. b. conc. resurf. 9.53 mi. State Rd. 33 from Churubusco to junction with U. S. Rd. 30, Churubusco Whitley Co.;

Calumet Paving Co., Zionsville, Ind., LB, **$228,191**, est. $325,813, c. conc. 2.717 mi. State Rd. 64 N.W. of State Rd. 257 S.E. to junction with Rd. 257 Rural District, Pike Co.;

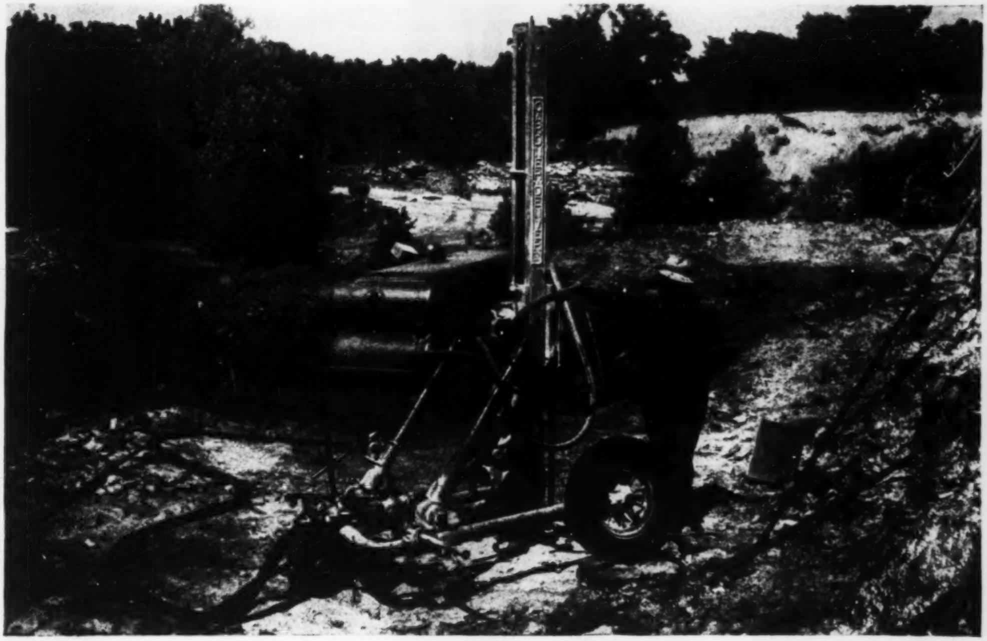
Bontrager Constr. Co., 311 W. Monroe St., Goshen, Ind. LB **$378,629**, est. $421,562, conc. surf. and resurf. and conc. base wid'n. 2.323 mi. State Rd. 32 west of Muncie to east of city, Muncie, Delaware Co.;

Wm. D. Voegel Constr. Co., 3760 E. St. Clair St., Indianapolis, Ind., LB, **$490,849**, est. $508,335, b. conc. surf. and resurf., conc. base wid'n. (dual lane—24 ft. each) 2.602 mi. State Rd. 67 West of Mars Hill, Marion Co. Bids Jan. 29. CD 1/8.

ILLINOIS—State Div. Hys., Springfield,

Gallagher Asphalt Co., 181 St. Indiana Ave., Thornton, Ill., CA. **$521,364**, bit. resurf. 9.33 mi. US 54 and Ill. 49 Will Co. Bids Jan. 11, awarded Jan. 24. CD 1/15, under LB.

(Continued on page 215)



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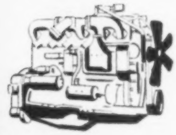

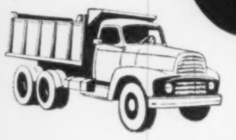

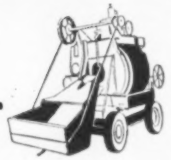

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CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

(Continued from page 212)

▲ **Great Lakes Dredge & Dock Co.**, 122 S. Michigan Ave., Chicago, 3, Ill., CA, **$6,597,510**, **cofferdam for $85,000,000 water filtration works**, CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Dec. 14, awarded Jan. 28. CD 12/18, under LB.

▲ **Kenny Constr. Co.**, 111 W. Washington St., Chicago, 2, Ill., LB, **$1,567,400**, Central South Side Sewers Indiana Ave. from 84 to 72 Sts. and 84 to State Sts., CHICAGO, ILL. City, City Hall, Chicago, 2, Ill. Bids, Jan. 25. CD 7/31.

Frederick Frank, Inc., Jefferson Bldg., Peoria, Ill., CA **$627,000**, **sewage treatment works and sanitary sewerage system**, CREVE COEUR, ILL. City, Creve Coeur, Ill. Awarded Jan. 23. CD 1/3.

MICHIGAN—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13,

Carl Goodwin & Sons, Allegan, Mich. LB **$694,121**, 24 ft. b. conc. dual roadway 4.953 mi. US-27 and M-78, F 23-17, C11, F 23-38 C1, F 33-26 C7, Eaton Co.;

Denton Constr. Co., 7170 General Motors Bldg., Detroit, Mich. LB **$587,976**. 24 ft. 43 ft. b. conc. 10 in. uniform 4.357 mi. US-25, F 50-27, C5, Macomb Co.;

Paul C. Miller, Comstock Park, Mich. LB **$128,646**, est. $120,000, aggregate surf. 4.71 mi. county road, CS 71-35 C1 (S 297 2), CS 71-36 C1 (S 316 9), Presque Isle Co.;

Nagelkirk & Ranta, 2550 Chicago Dr. S.W., Grand Rapids, Mich. LB **$320,793**, **stabilized aggregate surf.** 8.898 mi. M-30, SS 65-1 C2, Ogemaw and Gladwin Counties. Bids Jan. 30. CD 1/23.

† **Sugden & Sivier, Inc.**, 2323 E. 8 Mile Rd., Hazel Park, Mich. CA **$97,737**. storm sewer, drainage ditch, manholes, parking lot, roadway, etc., EBG 20-064-52-30, Center Line, DETROIT, MICH. U. S. Eng., 1900 Cadillac Tower, Detroit, Mich. Bids Jan. 12. CD 1/3.

† **Edward H. Meyer Constr. Co.**, Neenah, Wis. CA **$132,477**. **water sys., incl. high lift pumping station, wells, etc.**, Kinross Auxiliary Field, KINROSS, MICH. U. S. Eng., 1900 Cadillac Tower, Detroit 26, Mich. Bids Jan. 18. CD 1/3.

BUILDINGS

LOW BIDS AND CONTRACTS

Comte Constr. Co., 912 Summit St., Toledo, O., LB Est. **$725,000** general constr. 2 story HIGH SCHOOL, Moline-Millbury Rd. near Toledo Municipal Airport, MILLBURY, O. Bd. Educ. Lake Twp. School Dist., Millbury, O. Bids Jan. 25. CD 1/3.

Good Homes, Inc., Circle Tower, Indianapolis, Ind., Owner Builds, **$400,000**. 40 HOMES, St. Peter St., INDIANAPOLIS, IND.

▲ **Grinslade Co.**, 219 E. Ohio St., Indianapolis, Ind., Owner Builds, **$1,500,000**, 150 HOMES Ritter Park, INDIANAPOLIS, IND. Clifford Krabbenhoft, c/o owner, engr.

▲ Kaiser-Ducett Co., 80 E. Jackson Blvd., Chicago, 4, Ill. CA, **$1,200,000**, **100-bed, face brick** HOSPITAL

(Continued on page 217)

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Forty-two years of successful service all over the world have established the superiority of Sauerman Scrapers and Cableways for a great variety of long range material-handling jobs.

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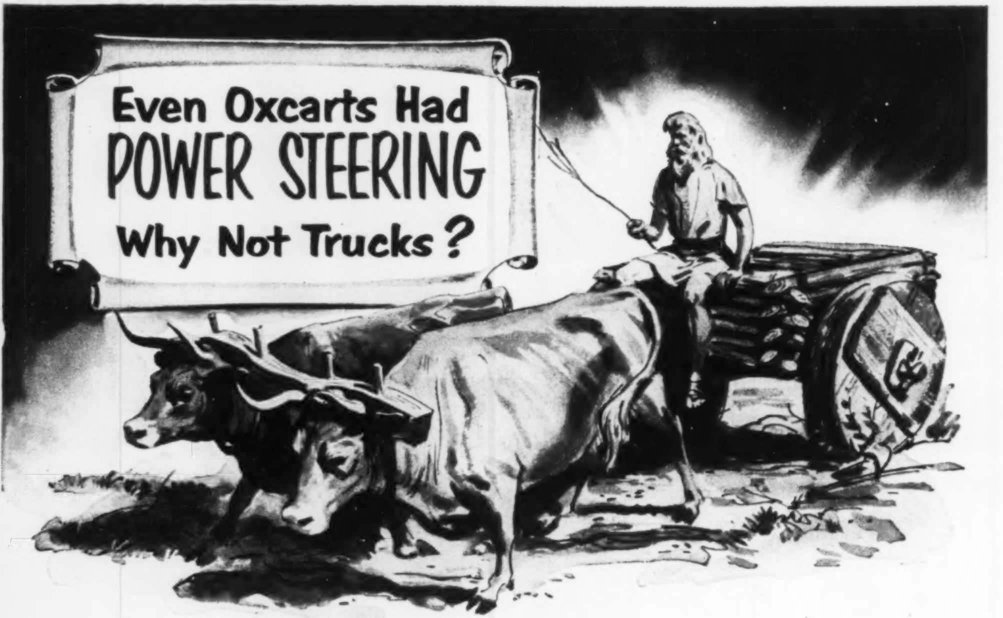

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When the earliest oxcart creaked and groaned its way in man's most ancient effort at wheel transportation, the driver who shouted the primitive equivalent of "gee" and "haw" had the benefit of power steering. For, he only guided the oxen with his voice or whip—the animals supplied the power for turning.

These days about all we see of the ox is the hamburg in the corner joint, but in taking the animal out of transportation we have loaded part of its work on the drivers of trucks and other vehicles. In trucks without power steering, the driver's muscles have to supply the turning effort. The power must come from his arms, shoulders and back.

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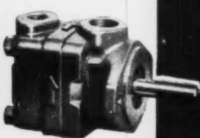

VICKERS hydraulic
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(Continued from page 215)

addn., BERWYN, ILL. MacNeal Memorial Hospital, 3244 Oak Park Ave., Berwyn, Ill. Bunham & Hammond, 53 W. Jackson Blvd., Chicago, 4, Ill., archts. Awarded Jan. 28. CD 5/10/50.

Arthur E. Nelson, 1244 E. 79 St., Chicago, Ill., CA, **$125,000**, 16,000 sq. ft. FACTORY, CHICAGO, ILL. Manufacturers Representatives, Inc., 5300 S. Knox St., Chicago, Ill. Kocher Busse & DeKreek, 7109 Stony Island Ave., Chicago, Ill., archts.

▲ **Contractors & Builders Inc.**, 228 N. La Salle St., Chicago, Ill., CA, **$1,000,000**. 75 RESIDENCES, PARK RIDGE, ILL. Co-operative Home Builders, Inc., 228 N. La Salle St., Chicago, Ill. Awarded Jan. 28.

E. Koeppe, 1206 N. 13 St., Sheboygan, Wis., CA, 1 story, 113x165 ft., WAREHOUSE, GARAGE and OFFICE, METER REPAIR BLDG., SHEBOYGAN, WIS. Wisconsin Public Service Corp., Green Bay. Wis. E. A. Stubenrauch, 712 Erie Ave., Sheboygan, Wis., archt.

Kay & Saltz, Inc., Allen A. Saltz, 10057 Southfield Rd., Detroit, Mich. Owner Builds. **$550,000**. 58 brick single HOMES, DETROIT, MICH.

Stibbard Constr. Co., 3000 Grand River St., Detroit, Mich. CA **$720,000**. 2 story, bsmnt., brick, steel U. S. Grant SCHOOL addn., Stockton St., DETROIT, MICH. City, Bd. Educ., 1354 Broadway, Detroit, Mich. Bids Jan. 16. CD 1/11.

Arthur O. Misch Co., 17731 Van Dyke St., Detroit, Mich. CA **$300,000**. 1 story, bsmnt., brick, stone CHURCH, Cadieux and Cornwall, DETROIT, MICH. First Lutheran Parish, c/o Robert J. West, archt., 512 United Artists Bldg., Detroit, Mich. Bids Nov. 28. CD 11/26.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† Wyoming—B.A. 2/26—Bureau Reclamation Dpt. Interior, Casper, furnishing, del. control and relay switchboard for Laramie sub-station Kendrick Proj., Spec. 703S-232. adv. ENR 2/14. CD 9/12/44.

Nebraska—RURAL DISTRIBUTION LINES—B.A. 2/27—Niobrara Valley Electric Membership Corp., O'Neill, 210.28 mi. rural distr. lines, Boyd, Holt and Wheeler Counties. Plans deposit $10. Philip L. Burns, 630 Davenport Bank Bldg., Davenport, Ia., consult. engr. CD 12/9/49.

† **Kan., Fort Leavenworth**—AIRFIELD PAVEMENTS—B. A. 2/28—Purchasing & Contracting Office, Fort Leavenworth, resealing joints in concrete airfield pavements at Sherman Air Force Base.

† **Oklahoma**—RAILROAD RELOCATION—B.A. 2/28—U. S. Eng., Box 62, Tulsa 2, Okla., rebuild and relocate railroad line at Altus, Jackson Co. $100,000.

† **North Dakota**—B.A. 3/4—U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck, tree planting, Stage I,

(Continued on page 219)

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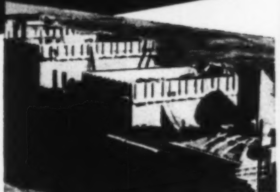

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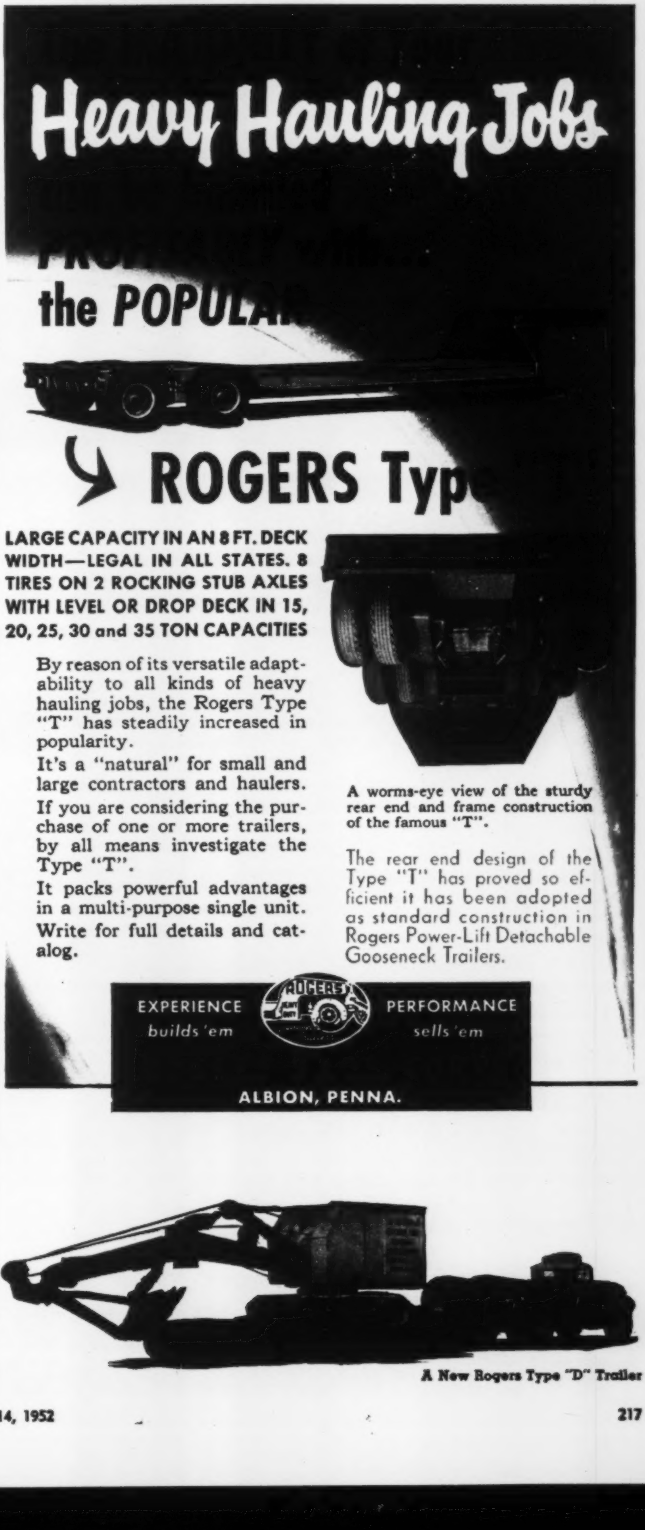

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PAYLOADER

(Continued from page 217)

Garrison Dam and Reservoir Proj., Inv. 52-29. CD 6/1/44.

† **Oklahoma**—B.A. 3/6—U. S. Eng. Box 60, Tulsa, Zone 2, pile bank protection work on Arkansas River, LeFlore Co. $400,000. CD 12/24/43.

† **South Dakota**—B.A. 3/6—U. S. Eng., 1709 Jackson St., Omaha, Neb., aerial power lines at Fort Randall Reservoir Proj., Inv. 52-75. CD 5/25/44.

† **South Dakota**—TRANSFORMERS, etc.—B.A. 3/11—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Sioux Falls, outdoor-type, power transformer; outdoor, power circuit breakers, outdoor, horn-gap switches; outdoor disconnecting switches for Sioux Falls Sub-station, Transmission Div. Missouri River Basin Proj. Inv. No. DS-3651.

† **Tex., Fort Hood**—B.A. 3/11—U. S. Eng., 606 Santa Fe. Bldg., Galveston, relocation of bldgs. and construction of road, ENG 41-243-52-41. CD 8/31/50.

BIDS ASKED—BUILDINGS

Tex., **Gilmer**—HOUSING—B.A. 2/21—Gilmer Housing Auth., Gilmer, Tex. 71-1, 30 units housing for Whites, $300,000; Tex. 71-2, 30 units housing for Negroes, $300,000. Extended date. Joseph H. Gaylord, 722 N. P. Anderson Bldg., Fort Worth, archt. CD 1/23.

Tex., **Longview**—SCHOOLS—B.A. 2/21—Longview Independent School Dist., Longview, 2 unit elementary schools. $350,000. Wyatt C. Hedrick, 904 Fort Worth Ave., Dallas, engr.-archt. CD 10/29.

Neb., **Omaha**—SCHOOL—B.A. 2/22—Bd. Educ., 3902 Davenport St., Belle M. Ryan School, 60 and Walnut Sts. $550,000. L. A. Daly Co., Insurance Bldg., archt. CD 3/14/51.

▲ Tex., **Dallas**—HOUSING—B.A. 2/25—Dallas Housing Auth., 2525 Lucas Dr., 544 low-rental housing units in West Dallas for Negroes, Tex 9-11A. $4,080,000. CD 1/29.

† N. M., **Albuquerque**—ENGINEERING—B.A. 2/26—U. S. Atomic Energy Comn., Box 5400, 80,000 sq. ft. engineering bldg., Inv. No. 293-52-5. $800,000-$1,200,000. Extended date. CD 1/4.

Minn., **Rosemount**—SCHOOL—B.A. 2/28—Bd. Educ., E. Doyle, clk., Independent School Dist. 5, 1 story, 45,000 sq. ft. school addn., $600,000. Plans deposit $15, Magney, Tusler & Setter, Foshay Tower, Minneapolis, archts. CD 73.

▲ Tex., **Waco**—HOUSING—B.A. 2/29—Waco Housing Auth., Waco, Tex. 10-3, 150 brick exterior housing units, concrete slab fdn. $2,872,000. Wm. McPherson, 114 Princess Pass, and Van Maltsberger, 2013 Belknap St., San Antonio, archts., R. Marvin Shopman, 145 W. Olmos St., San Antonio and Wm. H. Hall, Dallas, engrs. CD 6/22.

▲ **Mo., Kansas City — HOUSING** — B.A. 3/4 — Kansas City Housing Auth., c/o Forrest D. Byars, chn., City Hall, 462 negro housing units, Theron B. Watkins Homes, 12 to 14 Sts., Paseo to Woodland Sts., Proj. Mo. 2-2. $5,628,850. Neville, Sharp & Simon, 12 and Walnut Bldg., Kansas City 6, Mo., archts. CD 1/10.

† **Okla., McAlester**—MAGAZINES, etc.—B.A. 3/4—Dpt. Navy, Pub. Wks. Office, Bldg. 16, New Orleans, La., H-E magazines and fuse and detonator bldgs. $600,000. Benham Eng. Co., American Natl. Bank Bldg., Oklahoma City, engr. CD 1/15.

▲ Tex., **San Antonio**—HOUSING—B.A. 3/4—San Antonio Housing Auth., 400 Labor St., Tex. 6-11, 150 Latin-American housing. $1,125,000. Halsey & Royer, 2107 Transit Tower and F. Covington, Jr., 130 Adrian St., archts. Ford & Rogers, 228 E. Martin St., and Malcolm G. Simmons, Aztec Bldg., engrs. CD 9/5.

Tex., **Waxahachie**—HOUSING—B.A. 3/4—Waxahachie Housing Auth., Waxahachie, 44 housing units. $330,000. Extended date. Boese & Harkrider, Texas & Pacific Bldg., Fort Worth, engrs. CD 1/23.

▲ **Tex., Wichita Falls**—DWELLING UNITS—B.A. 3/4—Wichita Falls Housing Auth., Wichita Falls, Tex. 22-4, 182 dwelling units. $1,365,000. Plans deposit $50. Bid date changed. Boese & Harkrider, 308 Texas & Pacific Bldg., Fort Worth, archts. CD 2/4.

▲ Tex., **Paris**—HOUSING—B.A. 3/5—Paris Housing Auth., Paris, Tex. 48-1 and 2,200 dwelling units. $1,550,000. Plans deposit $50. Bid date changed. Boese & Harkrider, Texas & Pacific Bldg., Fort Worth, engrs.-archts. CD 1/31.

▲ Colo., **Denver**—HOUSING—B.A. 3/6—Denver Housing Auth., W. A. Gail exec. dir., 1449 Navajo St., 270 dwelling units, Colo. 1-10. Approx. $2,000,000. Plans deposit $50. C. F. Pillsberry, 320 Midland Savings Bldg., archt. CD 1/7.

Minn., **Shakopee**—HOSPITAL—B.A. 3/6—St. Mary's Assn., Inc., Mother Mary Laura, provincial superior, c/o H. H. Swanson, archt., 500 Sexton Bldg., Minneapolis, 2 story, bsmnt., 108x200 ft. St. Francis Hospital. $420,000. Plans deposit $30. CD 8/31/50.

▲† **Okla., McAlester**—MAGAZINES—B.A. 3/11—Dpt. Navy, Pub. Wks. Office, Bldg. 16, New Orleans, La., 91 smokeless powder magazines. $1,500,000. Benham Eng. Co., American Natl. Bank Bldg., Oklahoma City, engr. CD 1/15.

▲ **Wyo., Sheridan**—HOSPITAL—B.A. 3/17—Sheridan Memorial Hospital Assn., Sheridan, 90-bed hospital, $1,300,000. Fisher & Fisher, Denver National Bank, Denver, Colo., archts. CD 12/26/50.

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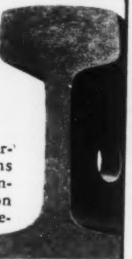

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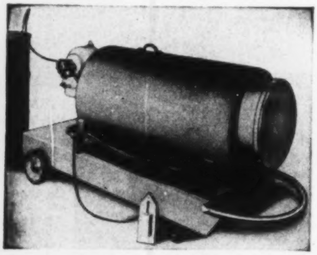

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† **Colo., Boulder**—HEALTH PHYSICS—B.A. 3/20—**U. S.** Atomic Energy Comn., P.O. Box 5400, Albuquerque, N. M. 1 story, 12,500 ft., rein.-con. frame health physics bldg. at Rocky Flats Project, near Denver, $375,000-$450,000. The Austin Co., 1300 Glenarm St., Denver, archt. and engr. CD 4/3.

▲ **Tex., Houston**—CHEMICAL PLANT, etc.—Bids Asked—Reichhold Chemicals, Inc., c/o Henry M. Reichhold, 601 Woodward Heights, Ferndale, Detroit, Mich., chemical plant mfg. phenol resins and phenol plastic products, $3,250,000; earthwork, grading, drainage, $75,000; road, street constr., and paved plant areas on Ship Channel, $90,000. CD 12/3/48.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Kehne Electric Co., 722 Raymond Ave., St. Paul, Minn. **$66,789.** street lighting, traffic signals in Minneapolis on Hiawatha Ave. between 8 and 24 Sts., Cedar Ave. between 24 St. and Minnehaha Ave., East Franklin Ave. between 18 and Snelling Aves., MINNESOTA. State Hy. Dpt., 1246 University Ave., St. Paul, Minn. Bids Jan. 18. CD 1/4.

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Feyen Constr. Co., 277 Burgess St., St. Paul, Minn. LB **$114,485.** c. conc. 0.4 mi. in Hector, Renville Co. Bids Jan. 18. CD 1/4.

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Hallett Constr. Co., Crosby, Minn., CA **$669,617,** paving 12 mi. between Shelly and Jct. T. H. 75 in Halstad, Norman Co.;

Schultz & Lindsay Constr. Co., 621 First Ave. N., Fargo, N. D., CA **$210,879,** grading, bridge 9.3 mi. between 0.2 mi. north of T. H. 16 at Manley and 9.3 mi. north, Rock Co.;

Herbison Constr. Co., Brainerd, Minn., CA **$259,311,** grav. base, road-mixed bit. surf. 10.2 mi. between Alvarado and Warren, Marshall Co.;

Roverud, Spring Grove, Minn., CA **$118,477,** crushed rock base, plant-mixed bit. surf. in Plainview, Wabasha Co. Grand Total $1,258,284. Bids Jan. 18. CD 1/4.

MISSOURI—State Hy. Comn., Jefferson City,

Porter, DeWitt Constr. Co., Dalton Bldg., Poplar Bluff, Mo. LB **$61,565,** three 45 ft. rein.-con. deck girder spans. Sta. 210 plus 26 over and Smith Hollow; LB **$275,565,** two 50 ft. I-beam spans, two 84 ft., one 105 ft. plate girder spans, two 77 ft., one 97 ft. plate girder spans; LB **$63,085,** four 30 ft., one 45 ft., rein.-con. deck girder spans, Sta. 275 plus 52, all in Phelps Co. Bids Feb. 1. CD 1/16.

J. E. Latta Constr. Co., 6609 Latta Pl., St. Louis 20, Mo. LB **$295,645.** altering MacArthur Bridge over Mississippi River, ST. LOUIS, MO. State Hy. Comn., Jefferson City, Mo. Bids Feb. 1. CD 1/16.

MISSOURI—State Hy. Comm., Jefferson City,

Porter DeWitt Constr. Co., Dalton Bldg., Poplar Bluff, Mo., LB **$662,649,** b. conc. 4.612 mi. Phelps Co.;

Gene McClain, Allerton, Ia. LB **$62,207.** 22 ft. rolled stone base, seal coat 7.528 mi. Harrison Co.;

S. J. Groves & Son Co., 500 Wesley Temple Bldg., Minneapolis, Minn. LB **$86,695.** b. conc. 0.489 mi. Sect. B, Phelps Co.;

Granite Bituminous Paving Co., 3943 Duncan Ave., St. Louis, Mo. LB **$138,871.** b. conc. 3.196 mi. St. Louis Co.; LB **$162,357,** b. conc. 3.99 mi. St. Louis Co. Bids Feb. 1. CD 1/16.

† **SOUTH DAKOTA**—U. S. Eng., 1709 Jackson St., Omaha, Neb.,

Ray Mills Constr. Co., 418 Keeline Bldg., Omaha, Neb., LB **$109,609,** Schedule A, primary excavation, culverts and pipes;

Central States Bridge Co., 1022 Trust Bldg., Lincoln, Neb. LB **$77,920,** Schedule B, 2 bridges;

G. H. Lindekugal & Sons, Spencer, S. D., LB **$199,972,** Schedule C, blacktopping of road;

The Missouri Valley Constr. Co., 1029 Omaha Natl. Bank Bldg., Omaha, Neb., LB **$489,145** for the entire project of South Access Road for Gavins Point Reservoir, Inv. 52-53, near Yankton. Bids Jan. 29. CD 12/6.

Nordling Constr. Co., Aberdeen, S. D., LB **$62,500.** grandstand for baseball park, ABERDEEN, S. D. City, Aberdeen, S. D., Bids Jan. 28. CD 1/17.

City, Huron, S. D. Hired Labor, Approx. **$65,000,** blacktop 15 blocks of streets, blacktopping south of auditorium priming asphalt runways and repair transition zones at airport, blacktop on concrete runways, paving areaway, enlarging ramp at airport, built light plane taxiway. HURON, S. D. CD 5/7/47.

Garland Constr. Co., Rapid City, S. D., **CA. $184,428,** reservoir, RAPID CITY, S. D. City, City Hall, Rapid City, S. D. Bids Jan. 21. CD 1/4.

▲† **Cook Constr. Co.**, Hy. 80 W., Jackson, Miss. LB **$1,266,246.** foundation of Kirwin Dam on Solomon River, near Kirwin, KANSAS. Bureau Reclamation, Dpt. Interior, Kirwin, Kan. Bids Jan. 31. CD 1/11.

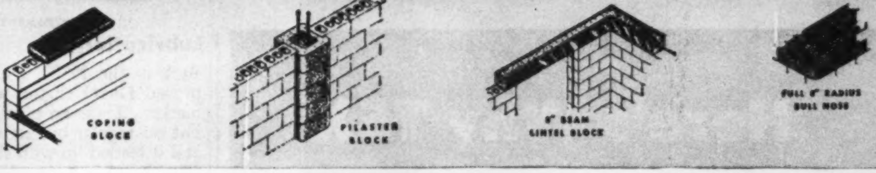
Douglas Contractors, Keeline Bldg., Omaha, Neb. LB **$572,271.** 455 mi. rural distr. lines, 18.79 mi. service lines, 7.35 mi. transmission lines, 9.71 mi. underbuilt lines, 51.55 mi. line changes, Barton, Edwards, Hodgeman, Ness, Pawnee and Rush Counties, KANSAS. Central Kansas Electric Co-operative, Great Bend, Kan. Bids Jan. 16. CD 1/9.

Brown Bros., Manhattan, Kan. CA **$36,700.** open Blue River Channel for drainage, MANHATTAN, KAN. City, Manhattan, Kan. Bids Jan. 22.

Oklahoma Paving Co., 4131 N. Portland St., Oklahoma City, 9, Okla., CA. **$69,086,** est. $70,858, steel sheet piling on Lake Overholser, OKLAHOMA CITY, OKLA., City, City Hall, Oklahoma City, Okla. Bids Jan. 29. CD 1/23.

Metropolitan Paving Co., 300 S. Indiana St., Oklahoma City 4, Okla., CA. **$75,839,** est. $75,349, grade and asph. pavement, Dist. 1165, OKLAHOMA CITY,

(Continued on page 224)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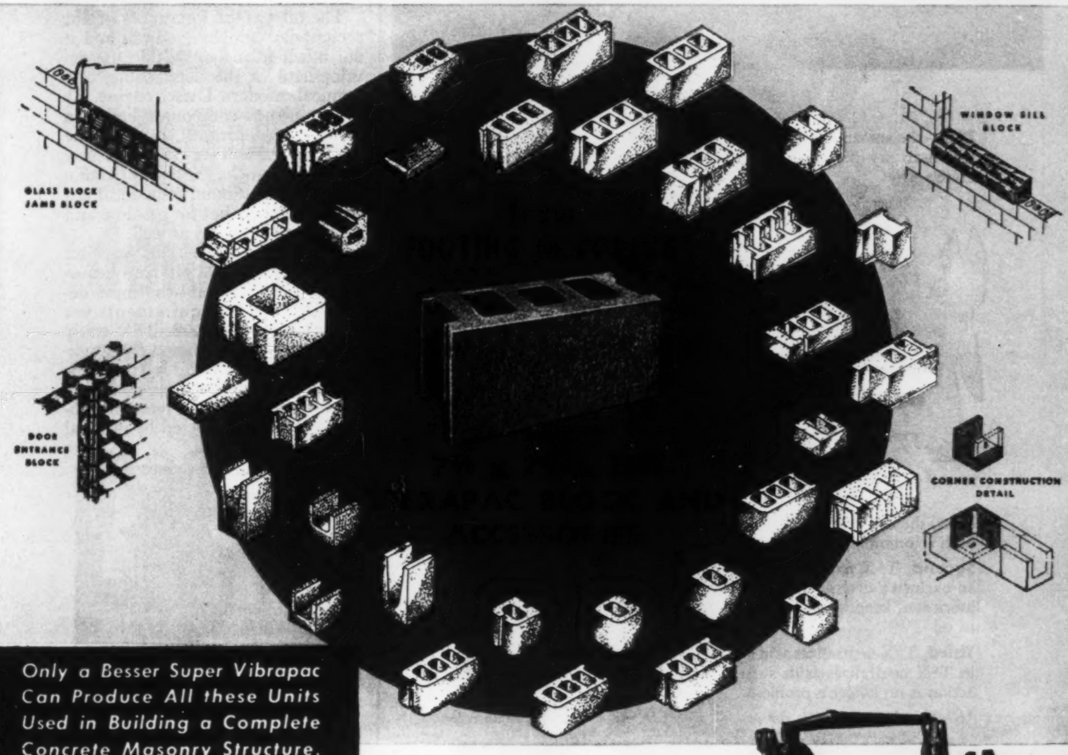
PILASTER BLOCK
8" BEAM LINTEL BLOCK
FULL 8" RADIUS BULL NOSE

All these Concrete Masonry Units Are Available at Your Nearby VIBRAPAC Plant!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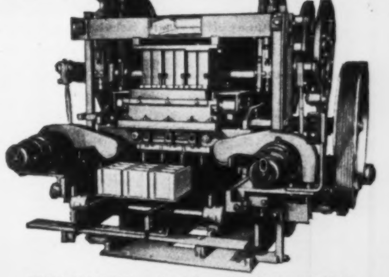
Only a Besser Super Vibrapac Can Produce All these Units Used in Building a Complete Concrete Masonry Structure.

You'll find it pays to build with concrete masonry, because this substantial, economical building material continues to have that "like new" appearance almost indefinitely. Check these plus values of concrete masonry buildings: *fire safety, storm safety, insulation against heat and cold, acoustical and soundproofing qualities, rodent and termite proofness, architectural beauty, lifelong durability, low maintenance cost and reduced fire insurance rates.*

Many large contractors have found it profitable to install a Vibrapac machine and produce their own concrete block. Why not investigate? Write today for literature and complete details.

Vibrapac plants are located in practically all important metropolitan areas. Write Besser Manufacturing Co. for name of Vibrapac plant nearest your project.



BESSER VIBRAPAC — the fully automatic concrete block machine. Produces high quality masonry units of any desired texture or density.

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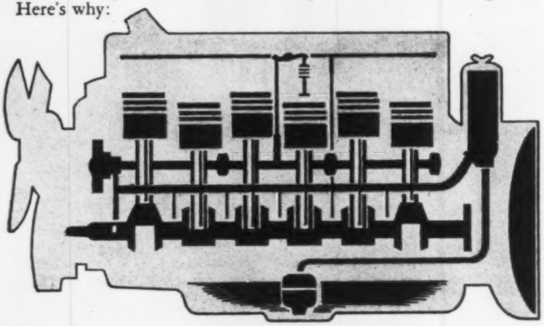
Here's Why T5X Gives Superior Engine Protection

T5X—the amazing purple* heavy-duty motor oil—gives greater protection to *any* internal combustion engine in *any* industrial operation. Here's why:



First, the base stock in T5X is 100% pure, paraffin-base oil, fortified with a combination of additives found in no other motor oil.

Second, T5X reduces sludge and carbon formation! T5X contains an exclusive detergent compound that enables the oil to clean as it lubricates, keeping particles of dirt and sludge suspended harmlessly in oil.

Third, T5X neutralizes acid action! A powerful alkaline reserve agent in T5X neutralizes acids so effectively that engine wear due to acid action is no longer a problem.

**Highly effective organic compounds give T5X its distinctive purple color.*

Learn today how T5X lubrication lowers maintenance and repair costs on internal combustion engines. Mail this coupon to your nearest Union Oil Company office for the booklet, "One For All," the story of heavy-duty T5X.

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Back in the 1930's a new and improved Diesel engine went on the market. It was an excellent engine, but on regular oils its valves stuck and it loaded up with sludge. In an effort to solve this problem, a group of scientists at Union Oil Company's laboratory at Wilmington, Calif., developed an oil with a remarkable cleansing agent. This oil—called D5X—kept the new Diesel clean beyond the fondest expectations of the manufacturers.

The oil was the forerunner of our present-day compounded oils and it did much to make possible the development of the dependable, economical, modern Diesel engine. By 1940 more new compounds had been added to the lubricant, and its name was changed to T5X. With the new compounds and a 100% pure paraffin base, T5X was found to be ideal not only for Diesels but for gasoline and gas-powered engines as well.

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In 1950, Union's research engineers developed new compounds for T5X that gave the oil even greater stability than before. With increased alkaline reserve, oxidation resistance, and detergency, T5X surpassed the exacting standards of U.S. Army specification 2-104B, *Supplement 1.* Its superiority has been clearly established in both the Coordinating Research Council gasoline engine tests and the rugged "Caterpillar" Diesel tests.

This great heavy-duty oil has made a reputation for dependability on the rough proving ground of the West. Now available on a nationwide basis, T5X will continue to prove itself under the most critical tests and operating conditions.

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(Continued from page 220)

OKLA., City, City Hall, Oklahoma City, Okla. W. W. Baker, c/o owner, city engr. Awarded Jan. 29.

† **Bureau Reclamation, Dpt. Interior**, 211 Federal Court House, El Paso, Tex. rejected bids Nov. 1, addns. to Dona Ana, Las Cruces and Central sub-stations, Rio Grande Proj., Spec. No. DC-3532, TEXAS-NEW MEXICO. CD 10/17.

The Western Constr. Co., Hobbs, N. M., CA. **$775,000.** 8 in. 50 mi. crude oil pipe line from Port Isabe. toward McAllen, TEXAS. Continental Pipe Line Co., 502 Navigation Blvd., Corpus Christi, Tex. CD 7/6.

City, Alvin, Tex., Purchase and Hire, **$70,000.** Unit of natural gas distr. lines, ALVIN TEX. Fred Martin, 7140 Dixie Dr., Houston, Tex., engr. CD 4/10/50.

City, City Hall, Amarillo, Tex. Own Forces, Approx. **$77,000.** 25,000 lin. ft. 6 in. and 2,000 ft. 8 in. sanitary sewer lines, AMARILLO, TEX. S. M. Field, city engr. CD 7/31/45.

Layne-Texas Co., 6419 Mapie Ave., Dallas, Tex., LB **$56,290**, construct 3rd water supply well; LB **$48,139**, cooling tower, chlorination unit, GARLAND, TEX., City, Garland, Tex., Bids Jan. 29. CD 1/16.

H. F. Allison, 7110 Junius St., and **E. E. Farrow**, 6109 Forest Park St., Dallas, Tex., CA. **$501,059**, sewage treatment plant and outfall line, GARLAND, TEX. City, Garland, Tex. Bids Jan. 8, awarded Feb. 1. CD 1/18, under LB.

J. S. Norman Building Corp., c/o J. S. Norman, Jr., 4815 Richmond Rd., Houston, Tex., Own Forces. **$48,125**, water lines, HOUSTON, TEX.

Reed Road Properties, Inc., 5200 Griggs Rd., Houston, Tex., Purchase and Hire. **$42,128**, water lines, facilities, HOUSTON, TEX.

George Constr. Co., 9410 Market St. Road, Houston, Tex., CA. **$61,117**, storm sewers; CA **$69,000**, sanitary sewers, HOUSTON, TEX. Reed Road Properties, Inc., 5200 Griggs Rd., Houston, Tex. CD 1/28.

Reed Road Properties, Inc., 5200 Griggs Rd., Houston, Tex. Purchase and Hire. **$67,776**, street constr. and surf. HOUSTON, TEX.

J. S. Norman Building Corp., c/o J. S. Norman, Jr., 4815 Richmond Rd., Houston, Tex., Own Forces. Approx. **$65,000.** street constr., surf., curbs, gutters, HOUSTON, TEX.

Campbell Constr. Co., 6206 Pineway St., Houston, Tex., LB **$130,275.** storage yard, HOUSTON, TEX. Houston Navigation Dist., c/o Wharf 13, W. F. Heavey, dir. and Port Terminal Ry. Assn., Houston, Tex., Bids Jan. 24. CD 12/31.

Southwestern Bell Telephone Co., 1121 Capitol St., Houston, Tex., Force Account, **$175,000.** construct unit of underground telephone conduits for large cables, HOUSTON, TEX. CD 5/9/50.

J. R. Fanning, Lubbock, Tex., LB **$79,995**, est. $106,000, sanitary sewer imprvs. and line extens., LUBBOCK, TEX., Bids Jan. 10. CD 1/3.

J. R. Fanning, Plainview Hy., Lubbock, Tex., LB **$66,182.** street wid'n., paving 34 St., 8 blocks Indiana St.;

Kerr & Middleton, 2206 Clovis Rd., Lubbock, Tex., LB **$89,134**, est. $90,000. wid'n. asph. pavement Erskine St., from Amarillo Hy. to College Ave., LUBBOCK, TEX. City, Lubbock, Tex., Bids Jan. 24. CD 1/3.

West Texas Utilities Co., Abilene, Tex., Force Account. **$90,000**, addnl. units of power lines in rural districts, SAN ANGELO, TEX. CD 9/26.

City, San Marcos, Tex., Own Forces. **$60,000.** addnl. water lines extens., SAN MARCOS, TEX. R. C. Daniels, city engr. CD 12/11.

City, San Marcos, Tex., Own Forces. **$80,000**, sanitary sewer lines, SAN MARCOS, TEX. R. C. Daniels, city engr. CD 12/11

City, Sinton, Tex., Own Forces. **$42,500.** addnl. water sys. rehabilitation, SINTON, TEX. CD 8/27.

City, Sinton, Tex., Own Forces. **$65,000**, sewage disposal plant unit, SINTON, TEX. CD 8/27.

West Texas Utilities Co., Abilene, Tex., Force Account. **$90,000.** some electric power lines above ground, SONORA, TEX. CD 9/26.

Fort Bend County Water Control & Imprvt. Dist. 2, Stafford, Tex., Own Forces. **$38,000.** some water lines, STAFFORD and MISSOURI CITY, TEX. S. A. Russell, Rosenberg, Tex., engr.

Martin County Water Control & Conservation Dist., Stanton, Tex., Own Forces. **$75,000**, water supply unit; **$50,000**, water mains, STANTON, TEX. CD 7/5.

City, Sulphur Springs, Tex., Purchase and Hire. Approx. **$40,000.** expansion of earthen water storage lake, SULPHUR SPRINGS, TEX. CD 3/30/51.

City, Sulphur Springs, Tex., Purchase and Hire. Approx. **$60,000.** sanitary sewer rehabilitation work, SULPHUR SPRINGS, TEX. CD 5/16/51.

Cascade Electric Co., 903 10 Ave. N., Great Falls, Mont. LB **$69,785.** airport lighting, GREAT FALLS, MONT. City, Great Falls, Mont. Bids Jan. 28. CD 1/17.

▲ † **Frank Tatsch**, 1150 N. Main St., Silver City, N. M., LB **$389,900**, one 3 story and two 2-story dormitories; LB **$134,620**, outside aerial electrical work; LB **$316,185**, mess hall and administration bldg., at Holloman Air Force Base, Serial No. 29-005-52-21, ALAMOGORDO, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Jan. 30. CD 1/23.

BUILDINGS

LOW BIDS AND CONTRACTS

Westinghouse Electric Corp., 2303 N. E. Kennedy St., Minneapolis, Minn. LB **$453,130.** furnish, install turbine at POWER PLANT, AUSTIN, MINN. City, Bd. Water, Elec., Gas & Power Comrs., W. D. Dunlap, secy., Austin, Minn. Bids Jan. 29. CD 12/27.

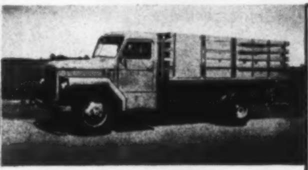
Leslie F. Crockett Constr. Co., 112 Academy Dr., Austin, Tex., CA. **$669,000.** West Austin Junior HIGH SCHOOL, AUSTIN, TEX. Austin Independent School

(Continued on page 227)

This light-duty model pays off in all seasons

The popular LD licks a lot of snow and ice, too! A *true* 4x4... it safely handles jobs that roll up excessive repair costs for ordinary vehicles.

When the rains come and the going is soft, the LD can travel while other trucks must stay at home. Its g.v.w. is 14,500 lbs.



Pays out on smooth highway, too! For general hauling or patrol work, the LD is a growing, economical favorite.

Many snowfalls and icy conditions are easily brought under control by this *light-duty* LD. The center differential of the LD eliminates stresses. That, plus other reasons, is why the LD works on assignments that often shove conversions and conventional trucks into the repair shop. Proof, too, of the LD's superiority in all seasons on a great work range. Ask FWD or your FWD distributor for facts. The FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis. *Canadian factory,* Kitchener, Ontario.

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You buy more than a truck When you buy an FWD

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- Ability to travel easily and safely on or off the highway
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- Lower maintenance costs (up to twice the front tire life, for example)
- Up to twice the truck life

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SWITCH TIES • PILES • TIMBERS

Pressure treated for products that last!

(Continued from page 224)

Dist., 701 E. 11 St., Austin, Tex. Bids Jan. 24, awarded Feb. 1. CD 1/29, under LB.

Viking Constr., Inc., 2624 East Lake St., Minneapolis, Minn. CA $346,000 general contract SCHOOL, GRANITE FALLS, MINN. Bd. Educ., A. Barber Jr., clk., Granite Falls, Minn. Bids Jan. 24. CD 1/3.

Adrian Koch, 5816 Potomac St., St. Louis 9, Mo. Owner Builds. $300,000. twenty-seven 24x30 ft., brick, RESIDENCES, Cannonbury Dr. and Selma Ave., WEBSTER GROVES (ST. LOUIS 19, P. O.), MO.

S. R. Smith Co., 1340 S. Harvard St., Tulsa, Okla., CA. $521,893. Eisenhower Elementary SCHOOL, 31 and New Haven Aves., TULSA, OKLA. Bd. Educ., 410 S. Cincinnati St., Tulsa, Okla. CD 1/16, under LB.

Leslie Crockett Constr. Co., 112 Academy Dr., Austin, Tex., LB $669,000. 1 story, semi-fireproof West Austin Junior HIGH SCHOOL, AUSTIN, TEX. Bd. Trustees, Austin Independent School Dist., 701 E. 11 St., Austin, Tex. Bids Jan. 24. CD 1/15.

Gulf Constr. Co., Inc., Box 661, Houston, Tex., CA. $505,098, est. $500,000. 2 story, 12,000 sq. ft. brick exterior research and producing LABORATORIES, drilled footings, grade beams, BELLAIRE, TEX. The Texas Co., Texas Co. Bldg., Houston, Tex. Bids Jan. 7, awarded Jan. 26. CD 1/28, under Lb.

▲ **Olson Brothers**, 2541 Times St., Houston, Tex., CA. Approx. $965,000, Compressor and Stripper PLANT; Approx. $92,500, REPAIR SHOP, STORAGE, near CUERO, TEX. Jergins Oil Co. of Texas and Associated Companies, c/o Shell Oil Co., Shell Bldg., Houston, Tex. CD 2/4.

▲ **Henger Constr. Co.**, Dallas Natl. Bank Bldg., Dallas, Tex. CA. Approx. $3,250,000. 6 story, bsmnt. MERCANTILE bldg., Commerce and Main Sts., DALLAS, TEX., Neiman-Marcus Co., Main and Ervay Sts., Dallas, Tex. DeWitt & Swank, 2025 Cedar Springs Rd., Dallas, Tex., archts. CD 1/8/51.

Southern Builders, 5200 Griggs Rd., Houston, Tex., CA. Approx. $371,000, 45 DWELLINGS, HOUSTON, TEX. Edgewood Corp., 5200 Griggs Rd., Houston, Tex. CD 1/28.

Jourdanton Independent School Dist., Jourdanton, Tex., cancelled bids to have been opened Feb. 15, SCHOOL, JOURDANTON, TEX. Est. $300,000. Will re-advertise. CD 1/30.

Southwestern Development Corp., 206 W. Ervay St., Dallas, Tex., Owner Builds. $325,000, 48 addnl. HOUSING units, SHERMAN, TEX. CD 9/12.

▲† **T. C. Bateson Constr. Co.**, Irwin-Keasler Bldg., Dallas, Tex., LB $2,828,910, 2 general purpose WAREHOUSES for Red River Arsenal, Inv. No. ENG 34-066-52-17, TEXARKANA, TEX. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Jan. 29. CD 1/22.

Carbide & Carbon Chemicals Div., Union Carbide & Chemical Co., Texas City, Tex., Own Forces. $525,000. Butasiene REFINERY unit, TEXAS CITY, TEX. CD 11/1/50.

Kelly S. DeBusk, Jr., Box 545, Luling, Tex., CA. $780,000, 130 low rent HOUSING units in total 19 bldgs., (Tex. 85-1 for 102 units, Tex. 85-2, for 28 units). VICTORIA, TEX. Victoria Housing Auth., Victoria, Tex. Bids Jan. 22, awarded Feb. 1. CD 1/29, under LB.

Lauch Constr. Co., 435 Ada St., Boise, Idaho. LB $343,851. general contract, completion Stewart Homes addn., 60 DWELLING UNITS, HELENA, MONT. Helena Housing Auth., Helena, Mont. Bids Jan. 27. CD 1/15.

Pew Constr. Co., Missoula, Mont. CA $497,025. general contract 3 story, brick, concrete MUSIC CLASSROOM and LABORATORY, MISSOULA, MONT. Montana State University, Missoula, Mont. Bids Jan. 29. CD 1/16.

† **Olson Constr. Co.**, Railway Exchange Bldg., Denver, Colo., CA, $794,148, ADMINISTRATION bldg., PLANT PROTECTION bldg. and MEDICAL bldg., driveways, parking areas, etc. near Denver, Rocky Flats Project Inv. No. 292-52-15, BOULDER, COLO. U. S. Atomic Energy Comn., P.O. Box 5400, Albuquerque, N. M. Bids Jan. 13, awarded Jan. 28. CD 1/29, under LB.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **California**—TURBINE DRAFT-TUBE PIER NOSES—B.A. 2/26—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Roseveille, 6 turbine draft-tube pier noses for Folsom Power Plant, American River Division, Folsom Unit, Central Valley Proj., Spec. DS 3648. L. N. McClellan, ch. engr.

† **California**—B.A. 2/26—U. S. Eng., 751 S. Figueroa St., Los Angeles, imprv. San Diego River and Mission Bay, Mission Bay revetment, East shore of Main Channel San Diego River and Mission Bay, CIVENG 04-353-52-21; concrete foundations for 2 navigation light towers, Mission Bay Jetties, San Diego River and Mission Bay, CIVENG 04-353-52-22. CD 4/21/44.

† **Calif, Los Angeles**—B.A. 2/26—Veterans Admin., Munitions Bldg., Wash., 25, D. C. 500,000 gal. steel water Reservoir No. 303, Proj. No. 04-5331.

Calif., **Novato**—B.A. 2/26—North Marin Water Dist., Novato, treatment plant. Plans deposit $15. C. C. Kennedy, 604 Mission St., San Francisco, engr. CD 5/2/49.

Wash., Kennewick—B.A. 2/26—City, City Hall, treatment plant, $250,000. Plans deposit $25. N. W. Haner & Assoc., Education Center Bldg., Portland, Ore., engrs. CD 8/9/50.

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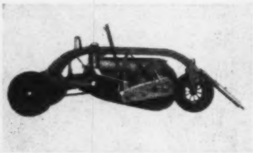
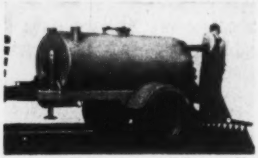


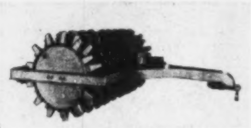
3 sweeper models, axle, engine or tractor powered.

Chip spreaders 8′ to 12′ width. Also asphaltic concrete spreaders.

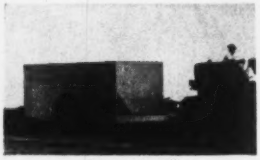
Rapid Fire circulating heaters heat and unload large tanks of asphalt.



Rapidspray Maintenance Distributors. Also heaters for production melting of barreled asphalt.



Sheepsfoot Rollers
250 to 600 psi.



Pneumatic rollers
7 to 50 tons.

W. E. GRACE MFG. CO.
6015 S. Lamar Dallas, Texas

† **Wash., Moses Lake**—AUTO MAINTENANCE SHOP—B.A. 2/26—U. S. Eng., City-County Airport, Walla Walla, auto maintenance shop, Eng. 45-164-52-16; construct taxiway lighting, Eng. 45-164-52-18, Larson Air Force Base. CD 11/5.

▲† **Washington**—RAILROAD RELOCATION—B.A. 3/4—U. S. Eng., City-County Airport, Walla Walla, 19.6 mi. railroad relocation and 1.9 mi. highway relocation, Walla Walla and Benton Counties. Over $1,000,000.

▲† **Calif., Miramar**—HEATING PLANT, etc.—B.A. 3/6—Dpt. Navy, Naval Auxiliary Air Station, San Diego, central heating plant and steam distr. sys. (first increment) $1,000,000. Plan deposit $80. CD 1/8.

† **OREGON**—B.A. 3/25—U. S. Eng., 628 Pittock Block, Portland, Zone 5,

Lane Co.—construct 4.28 mi. County Road. 360. Serial No. CIVENG 35-026-52-151.

BIDS ASKED—BUILDINGS

† **Wash., Fort Lewis**—WAREHOUSES—B.A. 2/25—Dpt. Army Purch. & Contg. Officer, Fort Lewis, rehabilitating 14 warehouses, Inv. 52-77. CD 11/7.

† **Wash., Fort Lewis**—PLATFORMS—B.A. 2/25—Dpt. Army Purch. & Contg. Officer, Fort Lewis, rein.-con. leading platforms along 29 warehouses, Inv. 52-78. CD 11/7.

Wash., Snoqualmie—SCHOOL—B.A. 2/26—Snoqualmie Valley School Dist. 410, Snoqualmie, 1 and 2 story, 36,900 sq. ft. masonry first unit of Mt. SI High School. $500,000. Mallis & De Hart, Lyon Bldg., Seattle, Zone 4, engrs. CD 11/10/48.

† **Wash., Fort Lewis**—TRAINING SCHOOL, etc.—B.A. 2/27—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 1 story, 39,000 sq. ft., rein.-con. specialist training school and 3 classroom bldgs., ENG 45-158-52-152, $750,000. Plans deposit $25. G. W. Stoddard & Assocs., 1231 Westlake Ave. N., Seattle, archts. CD 11/7.

SOON LETS CONTRACT—HEAVY CONSTRUCTION

Calif., Woodside—Mr. Paul Laning, 345 Forest Ave., Palo Alto, soon lets contract, road imprvt. Whipple Engineers, 205 Hamilton Ave., Palo Alto, engrs.

HEAVY CONSTRUCTION

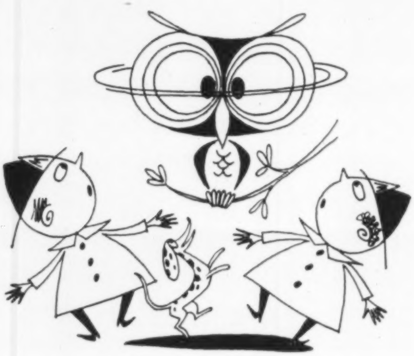
LOW BIDS AND CONTRACTS

† **Pennsylvania Transformer Co.**, Cannonsburg, Pa., LB, **$216,870**, three 13,500 kva-3-phase power transformers for Albeni Falls Dam, Inv. 52-22, Priest River, IDAHO, U. S. Eng., 47353 E. Marginal Way, Seattle, 4, Wash. Bids Jan. 29.

C. **A. Power**, E. 915 Marietta St., Spokane, Wash. and **A. J. Cherf Co.**, Ephrata, Wash., LB, **$755,922**, Div. B-2 of intercepting sewer project, involving

(Continued on page 230)

Head turns all the way around

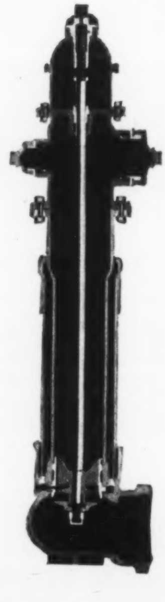


Nozzle direction may be changed easily and at any time by simply loosening the bolts in the swivel flange and turning the head . . . The number and size of nozzle outlets can be changed by replacing the head, and without shutting off the water.

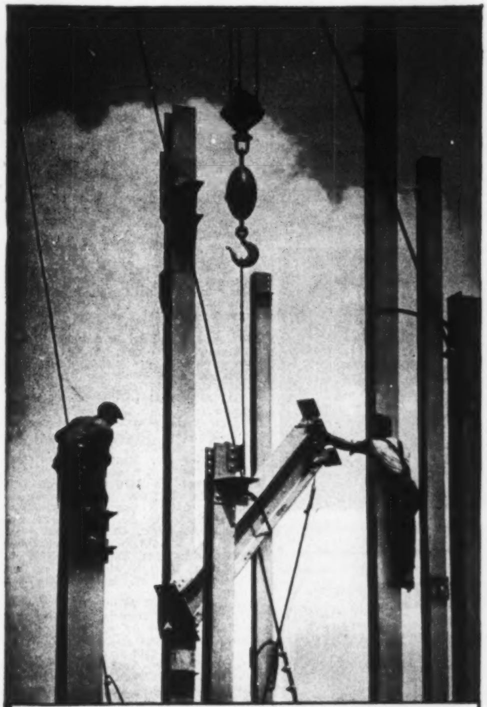
MATHEWS
HYDRANTS

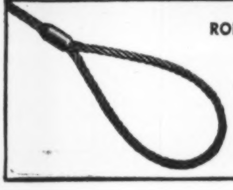
Made by R. D. Wood Company Public Ledger Building, Independence Square, Philadelphia 5, Pa. • Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

Mathews Modernized Hydrants . . . Tops in Convenience and Dependability Compression-type valve prevents flooding • Head turns 360° • Replaceable head • Nozzle sections easily changed • Nozzle sections raised or lowered without excavating • Protection case of "Sand-Spun" cast iron for strength, toughness, elasticity • Operating thread only part to be lubricated • All working parts contained in barrel • A modern barrel makes an old Mathews good as new • Available with mechanical joint pipe connections



WIRE ROPE





ROEBLING ALL-PURPOSE SLINGS with the Tapered Sleeve Splice come to you ready for the job. They cost less than tucked splices... have the full strength of the rope. Send for the full story.

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"BLUE CENTER" STEEL wire rope is an exclusive Roebling development. It has to pass the most stringent tests for strength, fatigue and abrasion resistance . . . gives rope the extra life that spells economies. Besides, Roebling Preforming assures you top performance on the job. "Blue Center" Preformed is easy to handle . . . has better spooling qualities . . . reduces vibration and whipping.

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Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

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proven dependability!
proven on-the-job economy!

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Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

(Continued from page 228)

6,200 ft. rock tunneling under Trent Ave. from Post to Scott Sts., SPOKANE, WASH. City, City Hall, Spokane, Wash. Bids Jan. 31. CD 1/22.

† **J. D. Shotwell**, 3113 S. Pine St., Tacoma, Wash., LB, **$74,648**, est. $83,098. grading, paving, draining, lighting and fencing parking areas at M. Rainier Ordnance Depot, ENG 45-108-52-145, TACOMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Jan. 29. CD 1/11.

▲† **S. A. Healy Co.**, 61 Westchester St., White Plains, N. Y., CA. **$4,888,600**, est. $6,922,020, cofferdam and powerhouse excavation, The Dalles Dam, CIVENG 35-026-52-123, OREGON-WASHINGTON. U. S. Eng., 628 Pittock Block, Portland, 5, Ore. Bids Jan. 22. CD 1/29, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Ralph Chisholm Constr. Co., 1726 State St., Bellingham, Wash., CA, **$535,150**, Carl Cozier Elementary SCHOOL, BELLINGHAM, WASH. School Dist. 501, Bellingham, Wash. Bids Dec. 10. CD 12/17, under LB.

W. B. Edmiston, Yakima, Wash., LB, **$684,364**, general constr. HIGH SCHOOL, EPHRATA, WASH. School Dist. 165-55 Ephrata, Wash. Bids Jan. 23. CD 12/28.

▲ **Roy T. Earley Co.**, 421 Middle Waterway, Tacoma, Wash., CA, **$2,200,000**, expansion Aluminum Reduction PLANT, LONGVIEW, WASH. Reynolds Metals Co., Longview, Wash. CD 7/5.

Wells & Wade, Wenatchee, Wash., CA, exhaust system, Approx. **$200,000**,

Bethlehem Steel Co., E. 3 St., Bethlehem, Pa., CA, steel;

Morrison-Knudsen, Inc., 319 Broadway, Boise, Idaho, CA, water intake system;

Kirkland Sand & Gravel Co., Kirkland, Wash., CA, sewage disposal plant;

Donald M. Drake Co., Lewis Bldg., Portland, Ore., CA, concrete work, for Aluminum PLANT, WENATCHEE, WASH. Aluminum Co. of America, 2156 Gulf Bldg., Pittsburgh 19, Pa. CD 1/18.

Harry K. Jensen, 1025 44 Ave., Oakland, Calif., LB, **$664,600** frame Christensen Lane SCHOOL, CASTRO VALLEY, CALIF. Castro Valley Elementary School Dist., A. B. Morris, supt. 7531 Castro Valley Blvd., Castro Valley, Calif. Bids Jan. 22. CD 1/9.

David Zuckerman, 1533 Main St., Walnut Creek, Calif., LB, **$584,565**, Charlotte Wood and Green Valley Elementary SCHOOLS, DANVILLE, CALIF. Danville Union Elementary School, Ivan D. Chappel, supt., Danville, Calif. Bids Jan. 24.

Wm. C. Crowell Co., 170 E. California St., Pasadena, Calif., CA, **$523,090**, Andres Elementary SCHOOL, DUARTE, CALIF. Duarte Elementary School Dist., Duarte, Calif. Bids Jan. 11. CD 1/25, under LB.

▲† **Del Webb Constr. Co.**, P.O. Box 4066, Phoenix, Ariz., CA, **$12,614,832**, permanent TROOP SPACES and other facilities, ENG 52-8, FORT ORD, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids Jan. 22, awarded Jan. 29. CD 1/30, under LB.

Fluor Corp., 2500 S. Atlantic St., Los Angeles, Calif., LB, **$199,337**, furnishing, installing cooling tower and appurtenances for No. 3 unit STEAM PLANT, Spec. 564 GLENDALE, CALIF. City, 613 E. Broadway, Glendale, Calif.

▲ **O. L. Carpenter**, 1102 Morena Blvd., San Diego, Calif., CA, **$1,267,769**, constr. Helix High SCHOOL, GROSSMONT, CALIF. Grossmont Union High School Dist., Grossmont, Calif. Bids Jan. 8. CD 12/27.

† **Haddock Engineers Ltd.**, Box 390, Montebello, Calif., CA, **$890,000**, North and South Elementary SCHOOLS, Naval Ordnance Test Station, INYOKERN, CALIF. Housing & Home Finance Agency, 1031 S. Broadway, Los Angeles, Calif. Bids Jan. 17, awarded Jan. 25. CD 1/25, under LB.

Kemp Bros., 8750 Mettler St., Los Angeles, Calif., CA **$628,200**, 1 story reinforced brick El Rancos High SCHOOL addns., WHITTIER, CALIF. Whittier Union High School Dist., 610 W. Philadelphia St., Whittier Calif. Bids Jan. 23. CD 1/2.

ALASKA

BIDS ASKED—BUILDINGS

† **Alaska, Eielson Air Force Base**—SCHOOL—B.A. 2/28—U. S. Housing & Home Finance Agency, New World Life Bldg., Seattle 4, Wash., 2 story, 12,000 sq. ft. ground area school. Plans deposit $50. Alaska Architectural & Eng. Co., 706 3 Ave., Fairbanks, archt.

† **Alaska, Ladd Air Force Base**—SCHOOL—B.A. 2/28—U. S. Housing & Home Finance Agency, New World Life Bldg., Seattle 4, Wash., 2 story, 64x152 ft. school. Plans deposit $50. Alaska Architectural & Eng. Co., 706 3 Ave., Fairbanks, archt.

▲ **Alaska, Anchorage**—HOUSING—B.A. 2/29—Alaska Housing Auth., c/o Miller & Ahlson, arcts., 1410 Hubble Pl., Seattle, Wash., 150 unit housing in 2 story frame bldgs. with central steam heating plant, ALAS-1-3. $2,000,000. Plans deposit $35. CD 4/23.

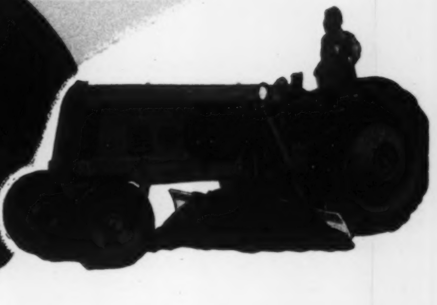
HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **S. Birch & Sons**, Ford Bldg., Great Falls, Mont. and **Lytle-Green**, 312 Masonic Temple Bldg., Des Moines, Ia., CA. **$548,708**, est. **$598,238**, roads, streets, lighting, drainage and other utilities, Inv. 52-33, Elmendorf Air Force Base, ALASKA. U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska. Bids Dec. 21. CD 12/27, under LB.

(Continued on page 232)

Some of the Jobs HUBER MAINTAINERS Are Doing



NATIONAL GOVERNMENTS

Grading and maintenance work on highways and secondary roads in national parks, reservations, national public lands.

STATES

Highway grading and maintenance service of many kinds including berm grading, mowing, ditch cleaning, etc.

COUNTIES

Highway and secondary road grading and maintenance work. Counties owning attachments keep HUBERS busy every month of the year.

MUNICIPALITIES

Street and alley grading and maintenance; every type of maintainer attachment is in municipal service.

TOWNSHIPS

Townships charged with road maintenance are among favorite users of Huber Maintainers for grader and maintenance work.

PUBLIC GROUNDS

Parks, playgrounds, conservation areas, publicly-owned beach areas need and use HUBERS for grader and maintenance service.

OIL FIELDS

HUBERS are at work in the oil fields, grading and maintaining off-the-highway roads and building dams around oil wells and storage tanks.

CEMETERIES

Cemeteries keep HUBERS busy every month, grading and maintaining drives, mowing, developing new grounds, removing snow, patching pavements, etc.

AIRPORTS

HUBERS are tailor-made for airport service, grading unpaved areas, patching paved areas, mowing, removing snow, towing planes, etc.

LOGGING

Grading and maintaining logging camp roads, mowing, bulldozer service.

INDUSTRIES

Many industrial users include factories with sizeable grounds and miles of roadways; lift loader widely used for cleanup work around factory sites.

MINES

Grading and maintenance of roadways; broom widely used around strip mines to sweep coal veins before removal.

ESTATES & RANCHES

Grading and maintenance of roadways; lift loader for cleanup; mower widely used.

RACE TRACKS

Grading and maintenance of track and of surrounding roadways and grounds.

CONTRACTORS

Contractors, large and small, in all kinds of contract work, are enthusiastic HUBER users. They like versatility of HUBERS, ability to move rapidly from one job to another.

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Manufacturers of Huber Maintainers, Graders and Complete Line of Rollers

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(Continued from page 230)

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Sask., Saskatoon**—HANGARS—B.A. 2/19—**Defence** Construction (1951) Ltd., Kensington **Bldg., Winnipeg**, Man., 2 structural **steel hangars at air force** base. Approx $1,600,000. Plans **deposit $100. W. J.** Milhausen, c/o owner, regional engr.

Que., St. Hubert—MESS—B.A. 2/26—**M. P. McAndrew,** engr., c/o Defense Constr. Ltd., 1247 Guy St., **Montreal**, officer's mess large (Scheme B, Class 1) **at Airport** Job 1777, Approx. $500,000. Plans **deposit $100.**

BIDS ASKED—BUILDINGS

Que., Nicolet—SEMINARY, etc.—B.A. About **2/29**—D. Deshaies, archt., 737 **Buchanan Ave., Ville St.** Laurent, 5 story, 62x282 ft., rein.-con., **brick seminary**, 3 story, **64x138** ft., rein.-con., **steel gymnasium**, laboratories, etc., 3 story, 42x144 ft., **rein.-con.** laundry and nurses residence for Le **Petit Seminaire** de Nicolet, Nicolet, Que. Approx. $900,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **ALBERTA**—Dpt. Highways, Edmonton, (Prov. Govt.)
Yukon Constr. Co. Ltd., 5-10105 -108 Ave., Edmonton, Alta., CA Approx. **$1,000,000**. 1,000 ft. rein.-con. bridge over South Saskatchewan River on Hy. **No.** A1-A2 at Medicine Hat (part of Trans-Canada Hy. construction program). Bids Jan. 18. CD 1/8.

Dpt. Transport, Hunter Bldg., Ottawa, Ont., **cancelled** bids to have been opened Feb. 1, 200x660 ft. runway, necessary taxiways, aprons, etc. to airport, ARMSTRONG, ONT. Approx. **$900,000**. CD 10/30.

Grey County Council, Owen Sound, Ont., Own Forces. **$515,000**, roads and bridges, OWEN SOUND, ONT. S. A. Fletcher, County Bldgs., Owen Sound, Ont., engr. Awarded Jan. 26.

Essex County Council, Windsor, Ont., Own Forces, **$542,000**, roads and bridges, WINDSOR, ONT. Awarded Jan. 25.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Collet Freres Ltee**, c/o "Job", Parent St., Ottawa, Ont., CA, Approx. **$1,500,000**, 5 story, bsmnt., rein.-con., medical faculty bldg., **Nicholas and Somerset** Sts., OTTAWA, ONT. University of Ottawa, Laurier Ave. E., Ottawa, Ont. LeFort & Gilleland, 85 Greenfield Ave., Ottawa, Ont., archts. CD 11/20/50.

Concrete Constr. Ltd., 1082 Decarie Blvd. **Montreal, Que.**, LB, **$822,185**, concrete frame at **Federal PRINTING** BUREAU, Sacred Heart Ave., HULL, QUE. **Dpt. P** Wks., Hunter Bldg., Ottawa, Ont. G. **Brault, c/o** owner, archt. CD 7/9/48.

Foundation Co. of Canada Ltd., 1000 **Sherbrooke St. W.**, Montreal, Que., CA, **$110,000**, BREWERY **alterations** and imprvts., MONTREAL, QUE. **Molson's Brewery** Ltd., 1670 Notre Dame **St. W., Montreal, Que.** McDougall, Smith & **Fleming, 1235 McGill College** Ave., Montreal, Que., archts.

LATIN AMERICA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Haiti**—Bids Asked—La **Plantation Dauphin S.A.**, D. J. **Lungwitz, mgr., Cape Haitien, Haiti, 45 mi.** asphalt highway and airport, north **coast, Haiti.** Approx. $1,000,000. **A. P. & R. K. Michaels, P.O.** Box 974, Orlando, Fla., U. S. A., **engrs.**

PROPOSED PROJECTS

WATER SUPPLY

Calif., Monrovia—City, City Hall, **$493,000 bond election** Feb. 26, WW Imprvs. James M. Montgomery, 15 N. Oakland St., Pasadena, Calif., consult. **engr.**

▲ **Calif., Torrance**—City, City Hall, **voted $2,000,000** bonds, **water system** imprvs. James M. **Montgomery,** 16 N. Oakland St., Pasadena, **consult. engrs. (Correction-status)**. CD 1/25.

Ky., Harrodsburg—City, **water** supply imprvs. **$350,000.**

▲ **Mass., East Bridgewater**—Town, Water Dpt., 11 Central St., **water** mains, **$1,000,000.**

Mass., Quincy—City, Manager Deegan, City Hall, **water** main repairs, **$517,000.**

▲ **Tex., Corsicana**—City, City Hall, **storage reservoir,** Chambers Creek, $750,000; **water mains, sys. rehabilitation, $250,000; water supply, $400,000. Forrest** & Cotton, **Praetorian** Bldg., Dallas, **consult. engrs.** CD 1/29.

Tex., Seadrift—Long Mott-Carbide and **Carbon Chemicals** Div. **of Union Carbide & Carbon Corp., Texas City,** Tex., **Chemical plant water supply (from Colorado** River) incl. **pumping plant, pipe main, etc.** Approx. $250,000. Lockwood & **Andrews, Union Natl. Bank** Bldg., Houston, consult. engrs.

▲ **Que., Sherbrooke**—City, A. Deslaurers, clk., **municipal** filtration plant, Approx. **$1,000,000.** J. C. **Cote, c/o** owner, engr. **Crepeau, Cote & Lemeux, 45 Wellington** St. N., engrs. CD 10/28/48.

SEWERS, WASTE DISPOSAL

Ala., Montgomery—City, sewage **disposal plant**, Approx. $300,000. Wiedeman & Singleton, **P. O. Box 1878** Atlanta, Ga., **consult. engrs.** CD 1/15/47.

(Continued on page 224)

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A BROAD LINE... WIDE EXPERIENCE

- BIN VALVES
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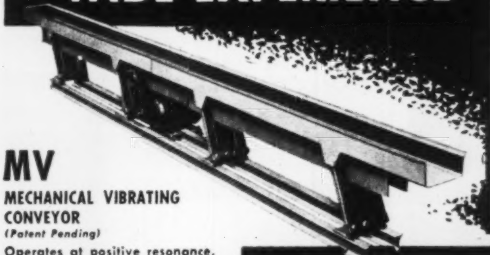
- CAR PULLERS
- CHAINS
- CONVEYORS
- COOLERS
- CRUSHERS
- FEEDERS
- PULVERIZERS
- SCREENS
- SEPARATORS
- TRANSMISSION MACHINERY



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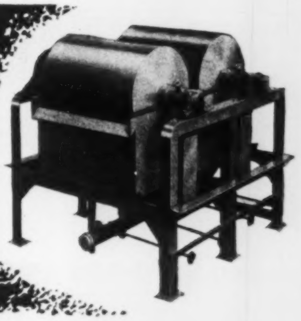
(Patent Pending)

Operates at positive resonance, resulting in attractive power savings. Flexibility of design provides ruggedness required for any job and permits use of open or enclosed pan or tubular conveying decks. Floor or suspension mounting without loss of capacity. Bulletin No. 826.



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(Patented)

Type shown is 3040 two-drum. Wet process types for effective separation of magnetic iron ore concentrates. A high and clean recovery.

MECHANICAL EFFICIENCY

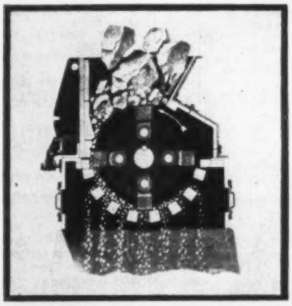
MIRACLE HAMMER CRUSHER
(Patented)

Heavy duty type for reduction of large pieces in single operation. Can do the work ordinarily done by two or more other types of crusher. Send for Catalog No. 837.

LOW COST OPERATION

GRIZZLY FEEDER

Provides a vibrating feeder and non-clogging grizzly in a single unit. Extremely flexible—handles large fluctuations in tonnage and feed size without mechanical adjustment. Catalog No. 830.



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ESTABLISHED 1877

Complete Line of Material Handling, Processing and Mining Equipment

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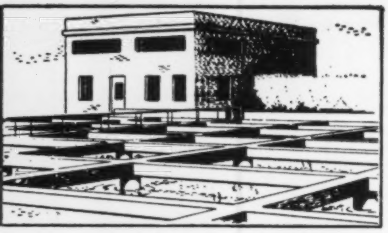
Bidding on a Water or Sewage Plant Job?



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offers you these outstanding advantages

- The skill and experience of an organization specializing in the furnishing and installation of mechanical equipment for water and sewage plants on a nation-wide basis.
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- Detailed layout drawing and sleeve locations made from the original plans.
- Dependable, top-quality water and sewage plant mechanical operating equipment.
- Installation of this equipment by skilled craftsmen who specialize on this type of work every day... all over the country.
- Greater savings... because of greater volume of work and mass buying of equipment.

Let Municipal Service Company skill and experience go to work for you... assuring you of efficient production and greater savings! Write, wire or call today for complete information!

City Officials! When your contractor hires Municipal Service to furnish and install mechanical equipment in your sewage or water plant you can be sure of dependable equipment . . . trouble-free operation . . . because of the skill and "know-how" of our engineers and craftsmen. Write or wire today for complete information on how Municipal Service can save your city money on sewage or water plant installations!

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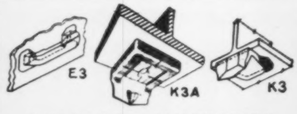

WELDING CONNECTORS

Saxe Welding Connection Units position and secure structural parts to be welded.

Clip K3A permits an adjustable connection.

These widely used units eliminate all hole punching and, with welding, produce the most economical, safe and quickly erected structural frame.

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Air Reduction Canada, Ltd. Montreal 2, Canada

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LOCOMOTIVE CRANES

GASOLINE • DIESEL
ELECTRIC • STEAM

25 TO 40 TON CAPACITY

OHIO LOCOMOTIVE CRANE
BUCYRUS, OHIO

(Continued from page 232)

Ga., Smyrna—City, sanitary sewer imprvs. **$450,000.** M. J. Hensley, Smyrna, consult. engr.

Ill., Mount Vernon—City, c/o City Council, voted $750,000 bonds, sewage disposal plant and other imprvs. to municipal sewerage sys. to stop pollution of Casey Ford Creek. CD 11/16/50.

Ind., Beech Grove—Bd. P. Wks., City Hall, sewage treatment plant and sewerage system, **$475,000.** Henry B. Steeg & Assocs., 2331 N. Meridian St., Indianapolis, Zone 2, consult. engrs.

Mass., Boston—State, Metropolitan Dist. Comn., Contr. Div., 20 Somerset St., grading, landscape Nut Island Sewerage Treatment Plant, **$300,000.** CD 5/12.

Mass., Quincy—City, Mgr. Deegan, City Hall, sewer work, various locations, **$400,000.**

N. C., North Wilkesboro—City, c/o mayor, City Hall, bond election Feb. 19, sanitary sewer imprvs. **$442,000.**

O., Dayton—Comrs. Montgomery Co., Court House, sewerage sys. in Holes Creek Sanitary Dist., southeast of Miami River south from David Rd. to Miamisburg-Centerville Rd. **$816,841.** Ralph L. Woolpert Co., 360 W. 1st St., consult. engr.

BRIDGES

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver,

Adams Co.—grade separation on North Federal Blvd. on State Hy. 1, Denver, SP 12-1-501, **$243,000.**

Pueblo Co.—repairing Main St. viaduct on State Hy. 1, Pueblo, SP 21-1-511, **$150,000.**

repairing East 4 Street Bridge on State Hy. 96, Pueblo SP 2-06-510, **$200,000.**

▲ **Mich., Port Huron**—City, Allen R. Hill, clk., steel, concrete bridge, Tenth Ave. **$1,500,000.**

Tex., Rankin—Upton Co., G. H. Fisher, judge, bridge constr. **$200,000.** Hasie & Green Eng., Wilson Bldg., Lubbock, consult. engrs. CD 12/4.

▲ **UTAH**—State Road Comn., State Capitol, Salt Lake City,

Grand Co.—800 ft. span steel bridge over Colorado River near Moab. **$1,000,000.** E. G. Johnson, state road engr.

STREETS AND ROADS

Ala., Mobile—Comrs. Mobile Co., Court House, paving 13 mi. Celeste Rd., **$300,000;** 2½ mi. Old Pascagoula Rd., **$65,000;** 6½ mi. Johnson Hy., **$100,000;** 3½ mi. Potter Tract Rd., **$75,000.** CD 6/18.

▲ **COLORADO**—State Hy. Dpt., 518 State Office Bldg., Denver,

Adams Co.—primary grading and structures, State Hy. 185, Denver-Broomfield, FI 002-1 (8), **$815,000.**

grading, structures, State Hy. 3, Adams City-Brighton F 006-1 (11), **$800,000.**

Alamosa Co.—stabilize and oil State Hy. 17 Alamosa-North, SP-30-17-506, **$120,000.**

Arapahoe Co.—grading, structures and c. conc. paving State Hy. 8, Watkins-West, FI 005-4 (3), **$280,000.**

stabilize and oil State Hy. 8, in Aurora, SP 10-8-515 **$185,000.**

Archuleta Co.—stabilizing, oil paving State Hy. 17, Chromo-North, F 024-1 (3), **$100,000.**

grading, oil paving State Hy. 10, Piedra River-East, F 022-2 (9), **$100,000.**

Baca Co.—grading, structures and oil State Hy. 100 Pritchett-West, S 0002 (13), **$60,000.**

grading, structures, oil State Hy. 100, Walsh-East, S 0002 (12), **$60,000.**

Boulder Co.—grading, oil State Hy. 93, Boulder SP 7-93-501, **$120,000.**

Cheyenne Co.—stabilizing and oil State Hy. 51, Cheyenne Wells-North, S 0001 (14), **$80,000.**

Conejos Co.—stabilize and oil State Hy. 136, La Jara-South, S $118 (1), **$65,000.**

Denver Co.—constr. right-of-way on State Hy. 72, Denver, UI 003-1 (4), **$1,570,233.**

Dolores Co.—stabilize and oil on State Hy. 6, Dove Creek to Utah Line, SP 58-10-512, **$140,000.**

Douglas Co.—c. conc. State Hy. 1, Castle Rock-Larkspur, FI 002-2 (24), **$720,000.**

grading State Hy. 86, Castle Rock-Franktown, S 0040 (2), **$70,000.**

Elbert Co.—imprv. State Hy. 81, Simla-North SP 34-8I-510, **$100,000.**

El Paso Co.—stabilizing and oil State Hy. 94, Ellicott-West, S 0020 (5), **$100,000.**

pavement wid'n. and resurf. proj. State Hy. 1, Pueblo-Colorado Springs, FI 002-2 (16), **$300,000.**

grading, structures, on State Hy. 1, Monument-Colorado Springs, FI 002-2 (25), **$874,000.**

Fremont Co.—stabilize and oil State Hy. 6 Canon City-West, SP 14-6-511, **$90,000.**

Garfield Co.—oil processing State Hy. 13, Rifle-North, F 018-1 (8), **$80,000.**

primary grading, structures asph. State Hy. 4, Rifle-De Beque, F 001- (4), **$505,000.**

Grand Co.—stabilize and oil State Hy. 2, Muddy Pass-Kremmling, SP 53-2-513, **$250,000.**

oil surf. State Hy. 9, Kremmling-South, S 0107 (9), **$90,000.**

Gunnison Co.—grading, oil State Hy. 6 west of Gunnison, F 021-1 (4), **$180,000.**

grading, structures and oil State Hy. 135, Gunnison-Cr. Butte, S 0119 (9), **$200,000.**

(Continued on page 236)

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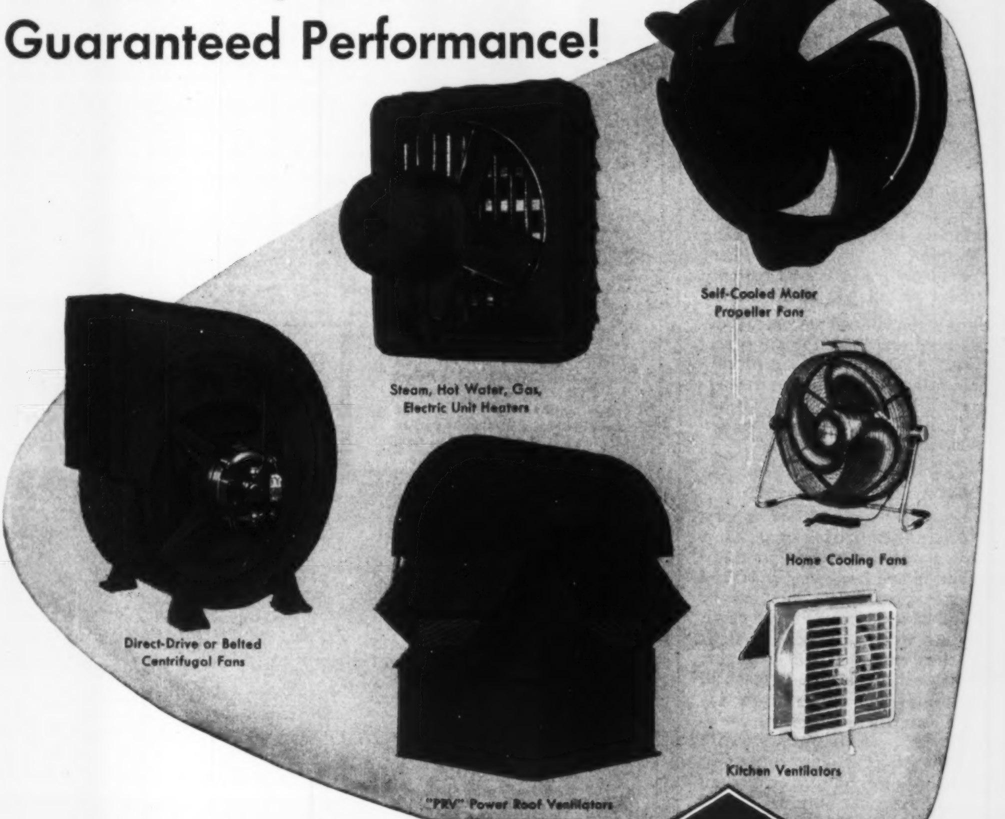
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COMMENT
from the
BUTLER ENGINEER

H-Bomb Baby Born at Butler Bin

I'm kind of a proud papa these days. Not to the point of stuffiness I hope; just walking around in a genial glow. But the baby *is* terrific and I simply have to tell you about him!

He's the control system we designed and built for the super-super automatic, completely interlocked, push-button operated Butler Central Mixing Plant which will pour concrete for the H-Bomb plant.

That baby was full grown at birth. Here's what he does:

He offers a choice of 5 predetermined batches at the turn of a selector knob. Hit push-button and batch starts. Filling gates open. Aggregates, cement and water flow until they reach exact weight. Each of 7 dials prints record of batch. Lights flash when balance is reached. Nothing can go wrong for it's all interlocked against every possible sin of omission and commission. A chimpanzee just hitting push buttons at random could turn out nothing but the right batch. Much more to tell but no room. Anyway, everything's as automatic as a trip to hell.

I'm afraid I stretched a point when I claimed sole parenthood. It always takes more than one to produce a baby. Here at Butler Bin all of us exchanged cigars at the birth for really everyone had a part in the conception. Sounds immoral, but you know what I mean.

Yours for that ounce of
H-Bomb prevention,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

P.S. Want to see pictures of our baby? We'll be proud to send 'em. Just ask!

Kit Carson Co.—grading, structures, asph. State Hy. No. 4, Arriba-Siebert, FI 005-5 (2), **$250,000.**

stabilize and oil State Hy. 51, Burlington-North SP 26-51-501, **$170,000.**

La Plata Co.—grading, structures, asph. State Hy. 10, Mancos-Hesperosa F 022-1 (7), **$349,000.**

stabilize and oil State Hy. 284, Bayfield-North, SP 20-284-501, **$80,000.**

Las Animas Co.—grading, structures, asph. paving State Hy. 1, Trinidad-South FI 002-3 (10), **$200,000.**

constr. right-of-way on State Hy. 1, Trinidad, UI 002-3 (8), **$225,000.**

Logan Co.—grading, oil State Hy. 61, Sterling-Otis, S 0009 (4), **$110,000.**

grading, structures and oil State Hy. 113, Sterling-Peetz, F 009-1 (2), **$137,000.**

grading State Hy. 2, Sterling-South, SP 13-2-504 **$60,000.**

Mineral Co.—stabilizing and asph. paving State Hy. 10, Twin Bridges-East, F 022-2 (7), **$145,000.**

Moffatt Co.—grading, structures, asph. paving State Hy. 2, Craig-East, F 005-2, (90), **$275,000.**

grading, oil State Hy. 2, Artesia-East, SP 42-2-520 **$250,000.**

Montrose Co.—grading, structures and oil paving State Hy. 145, Naturita-East, F 020-1 (4) **$250,000.**

Morgan Co.—stabilize, oil and bridge on State Hy. 52, SH 52-west to county Line, S 0030 (3), **$130,000.**

Ouray Co.—imprv. alignment and asph. on State Hy. 19, Ouray-South, SP 56-19-507, **$123,000.**

Park Co.—oil surf. State Hy., 9, Garo-Fairplay S 0101 (2), **$66,000.**

Pueblo Co.—stabilizing and asph. State Hy. 1 Pueblo-South, FI 002-2 (25), **$260,957.**

grading, structures and oil State Hy. 96, Boone-East, S0016 (4), **$100,000.**

constr. and right-of-way State Hy. 1, Pueblo UI 002-3 (11) **$700,000.**

Rio Grande Co.—stabilizing and oil paving State Hy. 10, Monte Vista-West, F 022-2 (8), **$100,000.**

Saguache Co.—grading, structures and oil State Hy. 114, Saguache-N. W. S 0124 (4), **$100,000.**

San Juan Co.—asph State Hy. 19, Silverton-South SP 55-19-502, **$97,700.**

Summit Co.—oil processing State Hy. 91, Climax-Kokomo, F 014-1 (1), **$70,000.**

stabilize and oil State Hy. 9, Dillion-North, SP 61-9-509, **$90,000.**

Weld Co.—grading, structures and oil State Hy. 392, Windsor-East, S 0034 (2), **$148,000.**

grading, structures and c. conc. State Hy. 2, Hudson-East, FI 003-1 (2), **$250,000.**

grading, structures, c. conc. State Hy. 3, Greeley-South, U 006-1 (7), **$85,000.**

Yuma Co.—stabilizing and oiling State Hy. 51, Wray-South, S 0001 (13), **$160,000.**

grading, surf. and oil State Hy. 51, in Wray S 0001 (11) **$80,000.** Mark U. Watrous, state hy. engr.

▲ Ill., **Oak Park**—Village, Village Hall, resurf. Madison St. from Oak Park to Austin Aves; resurf. 1 mi.

(Continued on page 240)

The Prime-Mover and one man dumps 1500 pounds of concrete every trip. A fleet of Prime-Movers makes quick work of pouring large areas—returns a nice profit on jobs where you have to be on the ball.

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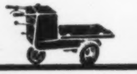

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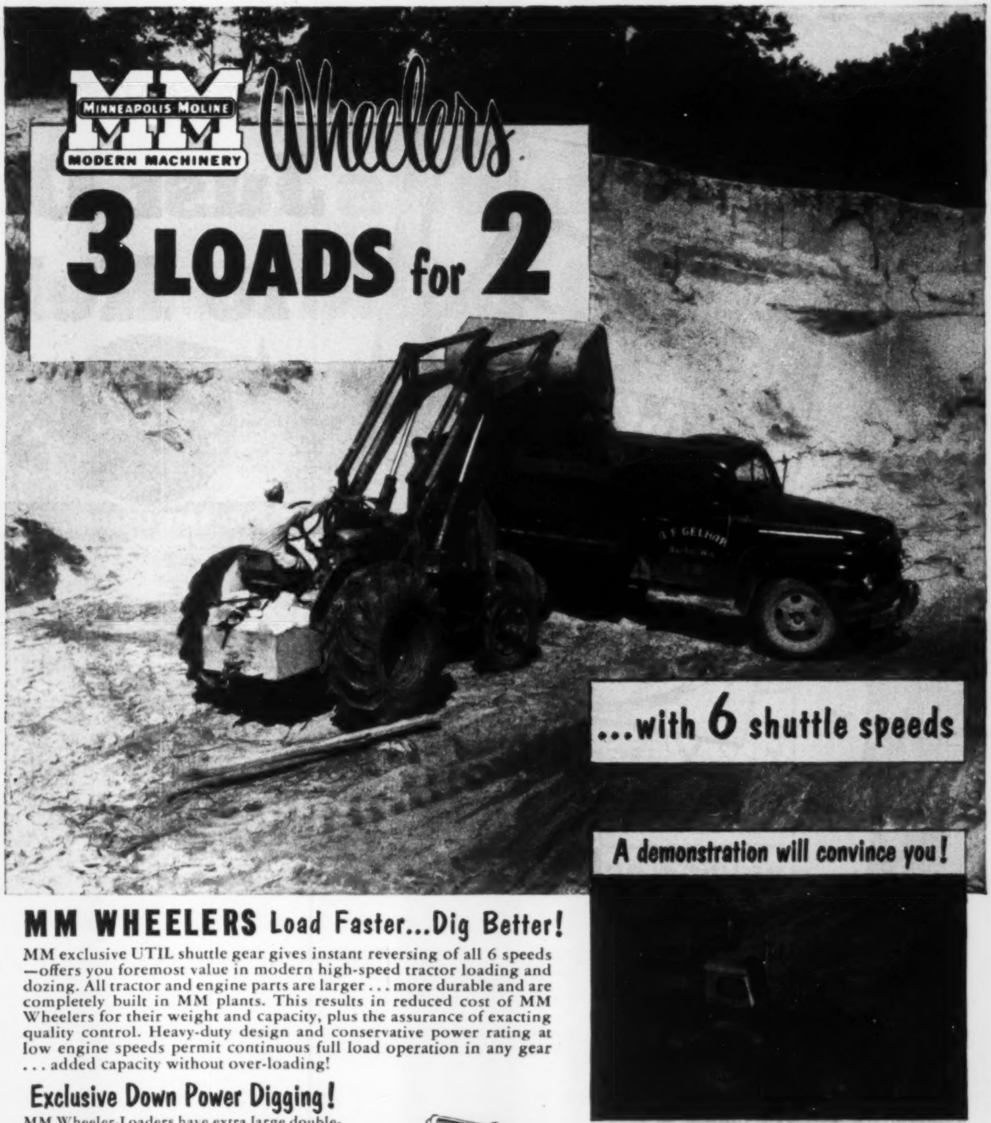

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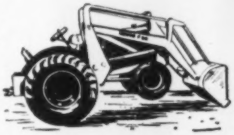

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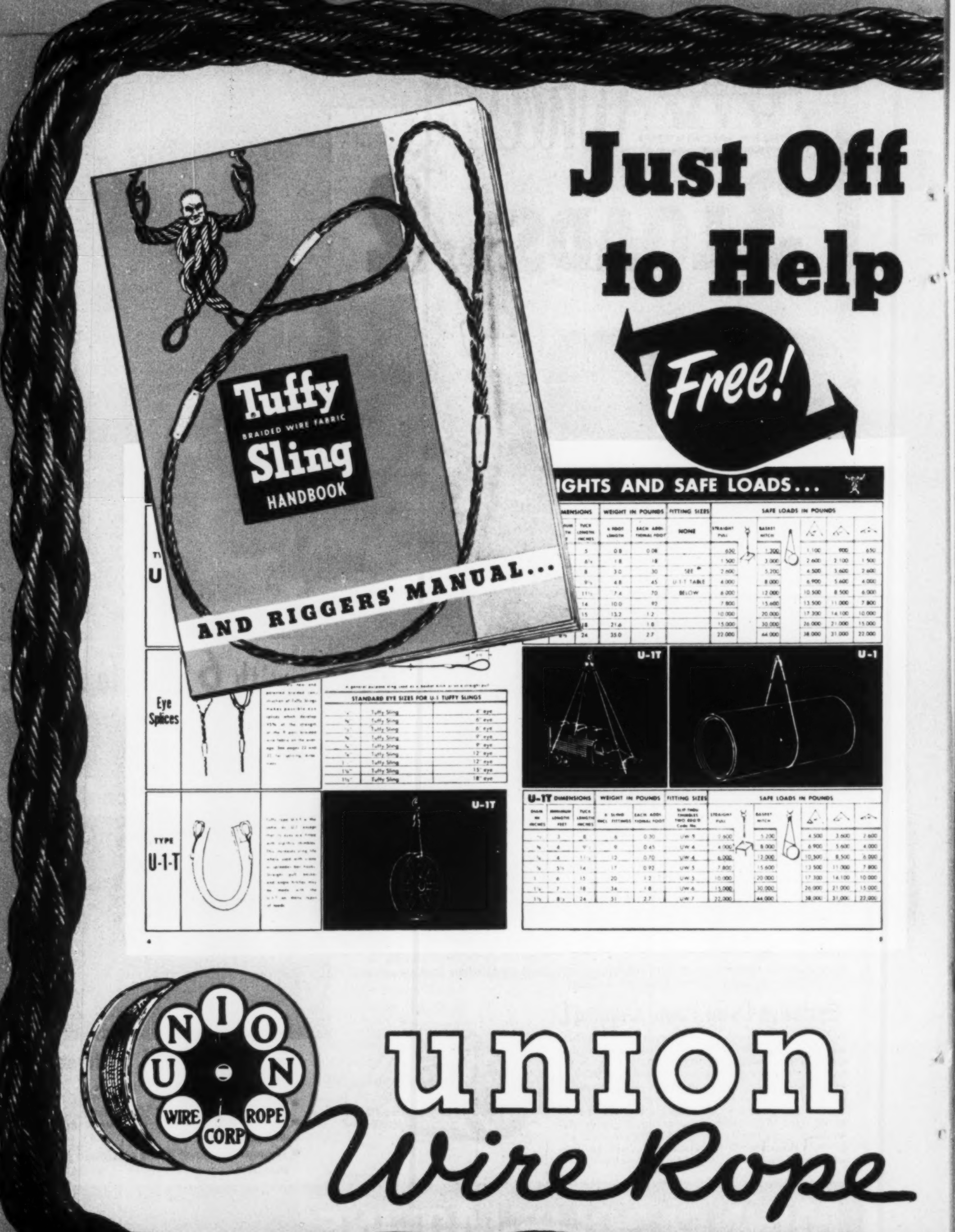

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(Continued from page 236)

Austin Ave. from North to Chicago Aves; resurf. 3 mi. East Ave. from North Ave. to Harrison St.; resurf. 2½ mi. Ridgeland St. from Augusta St. to Roosevelt Rd.; resurf. ½ mi. Division St. from Oak Park to Harlem Aves.; resurf. ½ mi. from Lake St. to Chicago Ave.; resurf. 1½ mi. Harvard St. from Maple to Austin Sts.; resurf. 2 mi. Euclid Ave. from Madison to North Aves; seal coating Jackson Blvd. from Oak Park to Austin Aves; seal coating 1 mi. Garfield Blvd. from Harlem Ave. to East St.; seal coating ½ mi. Harrison St. from Austin Ave. to East St.; wid'n. Austin Ave. from North to Chicago Aves; wid'n. 1 mi. Austin Ave. from Chicago Ave. to Madison St. Total est. $1,800,000.

▲ **Mich., Port Huron**—City, Allen R. Hill, clk., street paving, $1,000,000 early projects incl. 1.5 mi. c. conc., 2.5 mi. bit. macad., $375,000. CD 2/14/44.

EARTHWORK, WATERWAYS

▲ **Calif. Gilroy**—South Santa Clara County Water Conservation Dist., City Hall, 2 earthfill dams, relocation of roads, canals, etc. $3,500,000. Blackie & Wood, Flatiron Bldg., San Francisco, consult. engrs. 8/20/47.

▲† **Ohio**—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., Muskingum River Reservoirs. $472,000.

▲† **Ohio**—U. S. Eng., Engineer Park, Buffalo, 7, N. Y. imprv. Cleveland Harbor, $1,000,000.

AIRPORTS

† **Wash., Tacoma**—AIRPORT IMPRVTS.—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, clearing, grubbing, grading, draining and installation bulk aircraft fuel storage tanks at McChord Air Force Base. $350,000. CD 7/27.

▲ **T. H., Honolulu**—AIRPORT—City, terminal bldg. for Honolulu International Airport. $3,000,000. CD 6/18/47.

▲ **Man., Gimli**—HOUSING—Central Mortgage & Housing Corp., 400 Kensington Bldg., Winnipeg, will not construct 200 two-family units and 6-room school at R.C.A.F. Station, $1,400,000. Project cancelled. W. J. Milhuasen, c/o owner, engr. CD 12/31.

▲ **Man., Portage La Prairie**—HOUSING—Central Mortgage & Housing Corp., Kensington Bldg., Winnipeg, housing development for air force base, $1,500,000. W. J. Milhausen, c/o owner regional engr.

LATIN AMERICA

Mexico—Mexican Govt., Sira. de Recursos Hidaulicos (Hydraulic Resources Ministry) P. de la Reforma 69, Mexico City, Mexico, plans WW, sewerage, at Coahuila, Monclova, Villa Frontera, San Buenaventura. $750,000.

Mexico, Orizaba—City Govt, Palacio Municipal, Orizaba, plans public market. $300,000.

PUBLIC BUILDINGS

Calif., Barstow—SCHOOL—Barstow Union School Dist., Barstow, plans by Kistner, Curtis & Wright, 816 W. 5 St., Los Angeles, one school and addns. to another school, $787,227. CD 1/24/51.

▲† **Calif., Inyokern**—DORMITORY FACILITIES, etc.—Dpt. Navy, Naval Ordnance Test Station, Inyokern, plans by Kewell, Kocher & Benedict, 1344 Wilshire Blvd., Los Angeles, civilian dormitory facilities; plans by Eddy & Deasy, 1700 19 St., Bakersfield, permanent facilities for aircraft ranges; plans by J. H. Davies & Assoc., 730 E. 3 St., Long Beach, addnl. facilities at Morris Dam in San Gabriel Canyon, Azusa; plans by Wilson & Wilson, 2008 W. Seventh St., Los Angeles, underwater ordnance test facilities, San Clemente, at Naval Ordnance Test Station. Total $4,000,000.

▲† **Calif., San Diego**—BARRACKS, etc.—Eleventh Naval Dist., Public Works Bldg., plans by Periera & Luckman, 7421 Beverly St., Los Angeles, addnl. barracks bldgs., and utilities, incl. 9 barracks, headquarters bldg., drill field, services and utilities, at Naval Training Center, Approx. $3,000,000.

Calif., Sebastopol—SCHOOL—Analy Union High School Dist., Sebastopol, $990,000 bond election Feb. 21, school construction.

Calif., Stockton — LIBRARY — Stockton Unified School Dist., 324 N. San Joaquin St., plans by Mayo & Johnson, 306 Exchange Bldg., library at Stockton College, $535,000. CD 6/14.

Colo., Denver—MUSEUM—Denver Art Museum, City and County Bldg., plans by Burnham Hoyt, Colorado Natl. Bank Bldg., art museum, $500,000. CD 4/11/45.

▲ **Conn., Enfield** — HOUSING — Town Housing Auth., Town Hall, Thompsonville, PHA-Housing, $1,276,000.

▲ **Conn., Greenwich**—HOUSING—Town Housing Auth., Town Hall Annex, plans by Holden McLaughlin & Assoc., 570 Lexington Ave., New York, N. Y., housing, PHA 19-1, $1,000,000. CD 10/11.

▲ **Conn., New Haven**—HOUSING—City Housing Auth., 200 Orange St., plans by Schilling & Goldbecker, 30 Colony St., Meriden, housing, PHA Conn. 4-8. $1,500,000. CD 8/29/50.

(Continued on page 243)

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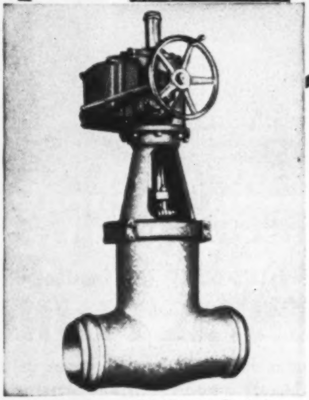
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SEWERAGE:

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Buffalo Sewage Disposal Plant, N. Y.
Cape May Sewage Disposal System, N. J.
Elizabeth Sewage Treatment Plant, N. J.
Wichita Sewage Treatment Plant, Kan.
Philadelphia Sewage Disposal Plant.
Yonkers Sewage Treatment Plant, N. Y.
Westchester Co., Yonkers Sewage Plant, N. Y.
City of Stevens Point, Wis.
Jamaica Sewage Treatment Wks.
Colorado Sewage Treatment Plant, Denver, Colo.

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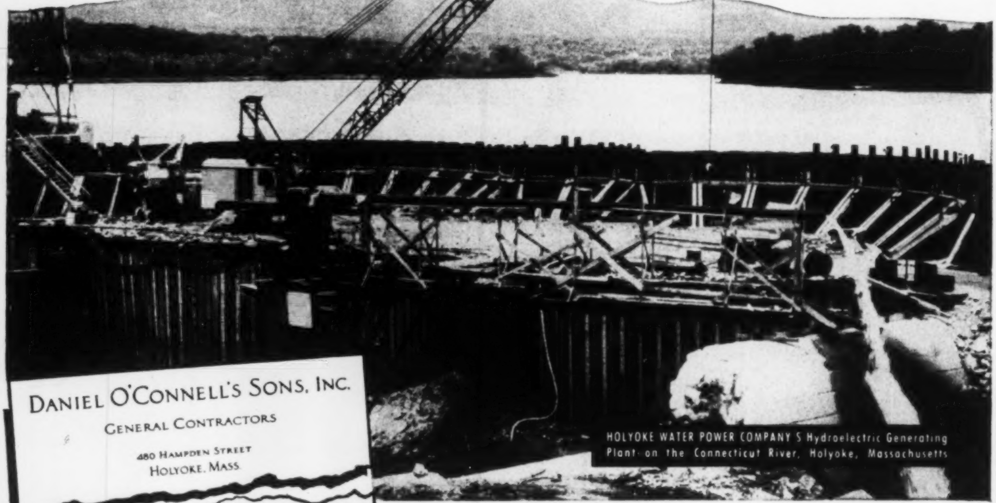

HOLYOKE WATER POWER COMPANY'S Hydroelectric Generating Plant on the Connecticut River, Holyoke, Massachusetts

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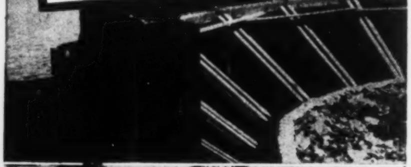
GENERAL CONTRACTORS
480 HAMPDEN STREET
HOLYOKE, MASS.

. . . and when we realized we needed substantial tonnages of piling in specific sections and lengths -- we found it gratifying to be able to rely on your dependable delivery. Our design was complicated and we must tell you your supplying exact specifications contributed to the success of this unusual job.

Very truly yours,
DANIEL O'CONNELL'S SONS, INC.
BY: Daniel J. O'Connell

INTERESTING NOTE: Mr. O'Connell's great-grandfather worked on the original wood dam, built over a hundred years ago, and his uncle worked on the present masonry dam constructed 50 years ago.



Piling was driven 20 feet below river bed elevation 70 to establish firm anchorage. In certain sections, the bottom of the sheeting had to be grouted to existing underwater structures to effect a more water-tight construction.

Contractor DANIEL O'CONNELL'S SONS, Inc. *Specified—*

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Exceptional skill and workmanship were "musts" here—in the successful design and in the accurate setting and driving of steel sheet piling. These cofferdam cells, each 76 ft.-4¾ in. in diameter, were required to allow removal of an existing masonry abutment and thus clear the way for two large concrete intakes to carry water to the turbine in the company's new $6 million plant (15,000 KW capacity). Unusual complications made the job extremely difficult—seepage was heavy due to uneven surfaces of the river ledge below the piling, and with a maximum 46 ft. head of water, strong reinforcing was required.

With such extensive planning and scheduling required to complete this project efficiently, the contractor realized that dependable piling delivery had to be counted on—piling had to be the exact sections and the exact proper lengths. Foster was the one large source to turn to.

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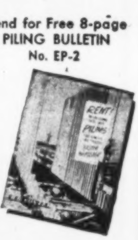

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(Continued from page 240)

Conn., Seymour—HOUSING—Town Housing Auth., Seymour, PHA-Housing, $550,000.

▲ **Conn., Stamford**—HOUSING—City Housing Auth., 56 Putnam Lane, plans by Harrison Ballard & Allen, 123 E. 77 St., New York, N. Y., PHA 7-2 housing, $2,500,000.

Conn., Wallingford—HOUSING—Boro Housing Auth., Town Hall, PHA-Housing, $550,000.

▲ **Fla., Jacksonville** — AUDITORIUM — Florida State Improvement Comn., Caldwell Bldg., Talahassee, plans by Marsh & Saxelbye, Bernard W. Close and Kemp Bunch & Jackson, Florida Theater Bldg., auditorium. Approx. $3,500,000.

▲ **Ga., Macon**—HOSPITAL—City, bond election Mar. 4, Macon Hospital addns. $2,500,000. CD 11/2.

Ga., Savannah—SCHOOL—City Bd. Educ., Savannah, plans by Oscar M. Hansen, 15 W. Liberty St., Mills B. Lane Negro Elementary School. $500,000.

▲ **Ill., Park Forest**—SCHOOL—School Dist. 227, City Hall, plans by Loebl, Schlossman & Bennett, 430 N. Michigan St., Chicago, Zone 11, 2 story, bsmnt., Rich Township High School, $1,250,000.

Ill., Western Springs—SCHOOL—School Dist. 101, 4225 Wolf Rd., plans by Berger, Kelley & Samuelson, 44 Main St., Champaign, 1 story grade school for Forest Hills area, $300,000; 1 story grade school for Field Park Area, $500,000.

▲ **Me., Bangor**—HOUSING—Bangor Housing Auth., c/o mayor's office, City Hall, housing, $2,200,000.

▲ **Me., Biddeford**—HOUSING—Biddeford Housing Auth., c/o mayor's office, 205 Main St., housing, $2,200,000.

▲ **Me., Brunswick** — HOUSING — Brunswick Housing Auth., c/o town mgr., Maine St., housing, $1,100,000.

Me., Fort Fairfield—HOUSING—Fort Fairfield Housing Auth., c/o Bd. Selectmen, 79 Main St., housing, $550,000.

▲ **Me., Gardiner**—HOUSING—Gardiner Housing Auth., City Hall, housing, $1,100,000.

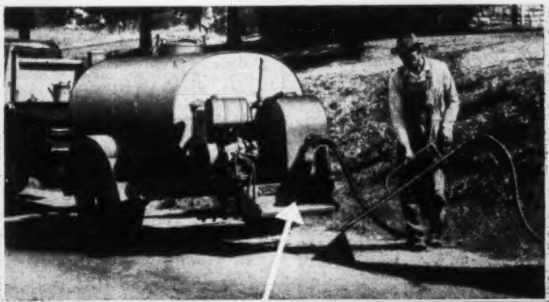
▲ **Me., Lewiston**—HOUSING—Lewiston Housing Auth., c/o mayor's office, City Hall Bldg., housing, $3,300,000.

Me., Norway—HOUSING—Norway Housing Auth., Town Hall, housing, $825,000.

▲ **Me., Portland**—HOUSING—Portland Housing Auth., Popham St., housing, $6,160,000.

Mass., Brookline—SCHOOL—Town, School Dpt., Town Hall, Devoiton School exten. $824,000. CD 3/17/49.

▲ **Mich., East Lansing**—ANIMAL INDUSTRIES—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, plans by O. J. Munson, 409 Wilson Bldg., Lansing, brick,



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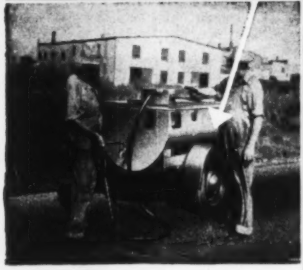

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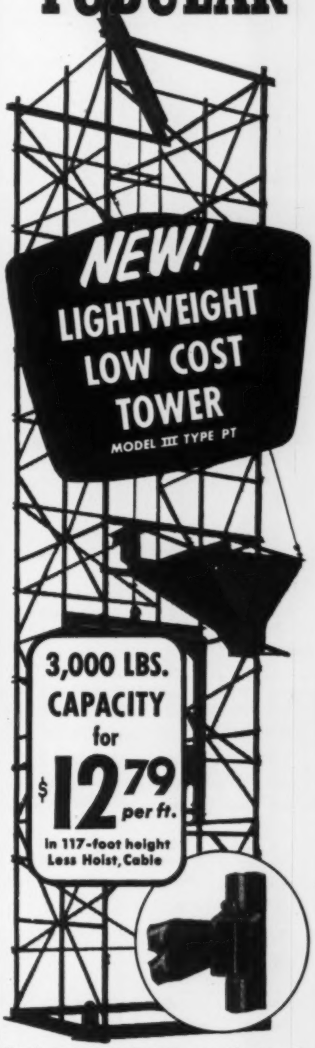

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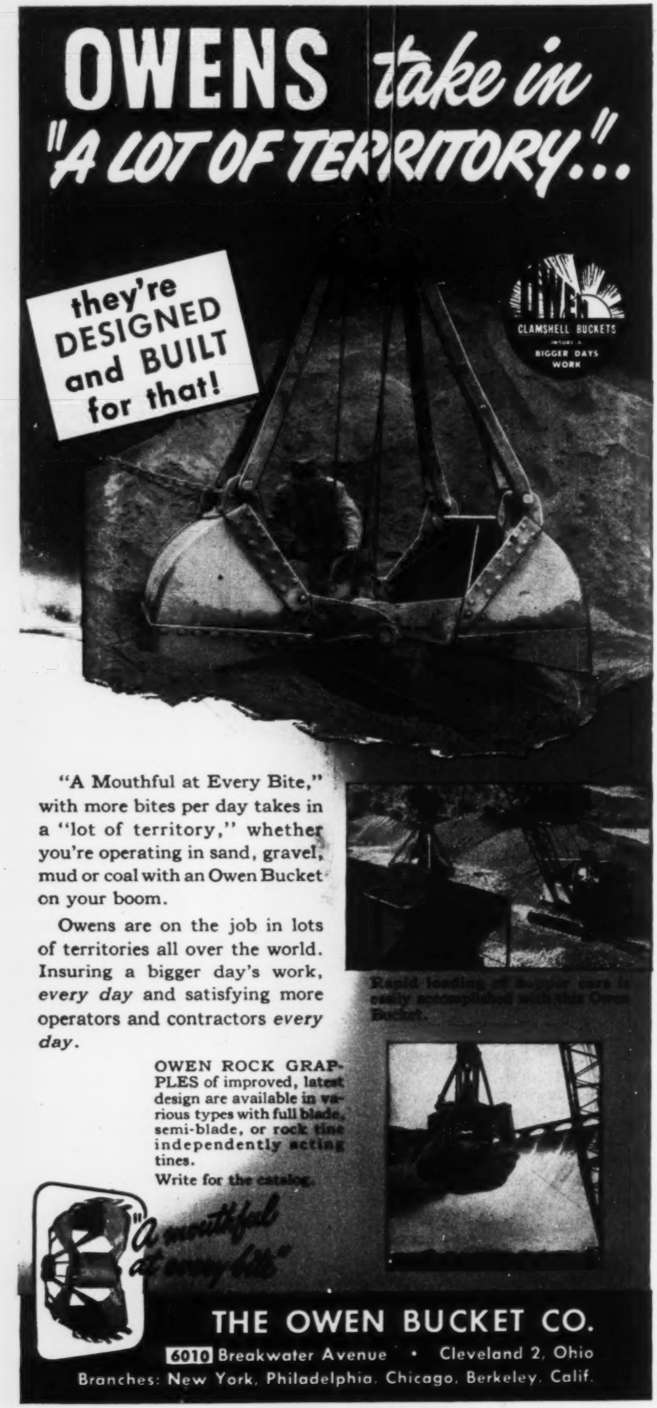

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▲ **Mass., Fall River**—HOUSING—Fall River Housing Auth., 151 Sunset Hill, housing, Proj. PHA Mass. 6-4, **$2,000,000.**

▲ **Mass., Gloucester** — HOUSING — Gloucester Housing Auth., G. W. McPherson, chn., 128 Main St., housing, Proj. PHA Mass. 17-2, **$2,200,000.**

▲ **Mass., Leominster**—HOUSING—Leominster Housing Auth., c/o mayors office, City Hall, housing, **$1,650,000.**

▲ **Mass., Marblehead**—SCHOOL—Town, Aura W. Coleman, supt. Schools, Town Hall, Junior-Senior High School, **$1,000,000.** CD 4/25/50.

▲ **Mass., New Bedford**—HOUSING—New Bedford Housing Auth., Presidential Heights, housing, Proj. PHA 7-4, **$2,200,000.**

▲ **Mass., Newburyport**—HOUSING—Newburyport Housing Auth., City Hall, housing. **$1,925,000.**

Mass., Norwood—HOUSING—Norwood Housing Auth., c/o town mgr., 566 Washington St., housing, **$550,000.**

▲ **Mass., Plymouth** — HOUSING — Plymouth Housing Auth., Town Square, housing, **$1,925,000.**

▲ **Mass., Salem**—HOUSING—Salem Housing Auth., 93 Washington St., housing. **$2,200,000.**

▲ **Mass., Southbridge**—SCHOOL—Town, School Bldg. Com., Wm. Orzech, chn., plans by George H. Sidebotton, 200 Haven St., Reading, and William Wilson, consult. archt., 101 Park Ave., New York, N. Y., schools. **$1,000,000.**

▲ **Mass., Springfield** — HOUSING — Springfield Housing Auth., 124 Putnam St., housing, **$3,300,000.**

▲ **Mich., Hillsdale**—HOSPITAL—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, mental hospital. **$2,000,000.**

▲ **Mich., Midland**—HOSPITAL—City, Midland Hospital, plans by Alden B. Dow, Midland, 3 story, brick, steel hospital addn. **$1,500,000.** CD 2/23/51, under Commercial Buildings.

Mo., Independence—SCHOOL—Bd. Educ., c/o Katie Chastain, secy., voted $200,000 supplementary bonds Jan. 15, addns. Benton and Brvant Schools, **$650,000.** Robt. P. Weatherford & Victor J. DeFoe, 206 N. Liberty St., archts. CD 11/26, under LB.

▲† **Mo., Overland (St. Louis 14, P. O.)**—RECORD CENTER—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., plans by Hellmuth, Yamasaki & Leinweber, Inc., International Office Bldg., 722 Chestnut St., St. Louis, John D. Falvey, 316 N. 8 St., St. Louis, and Wm. C. E. Becker, 11 N. 7 St., St. Louis, Zone 1, engrs. and archts., 6 story, bsmnt., 1,620,000 sq. ft. brick, rein.-con., steel Army Adjutant General Record Center, west of Woodson Rd., south of Page Ave., Overland area of St. Louis Co. **$22,700,000.** CD 10/16.

▲ **N. J., Trenton**—HOUSING—Trenton Housing Auth., 875 New Willow St., plans by Micklewright & Mountford, 72 Ewing St., 400 unit housing. **$2,500,000.** CD 11/14.

▲† **N. Y., Riverhead**—PLANT—Dpt. Navy, 18 St. and Constitution Ave. N.W., Wash. 25, D. C., jet plane plant on 4,500 acre site in Calverton-Manorville Wading River areas, to be built and operated by Grumman Aircraft Eng. Corp. of Bethpage, N. Y. **$22,000,000.**

▲ **N. D., Williston**—DWELLINGS—Williston Housing Auth., Williston, 150 dwelling units. **$1,000,000.**

▲† **Okla., Ardmore**—HOUSING—Housing & Home Finance Agency, 1626 K St., N.W. Wash. 25, D. C., 300 housing units for military and civilian personnel at Ardmore Air Force Base. **$2,250,000.**

Okla., Stillwater—CHAPEL, etc.—Oklahoma A & M College, Stillwater, plans by Phil. Wilber, Stillwater, Henry G. Bennett Memorial Chapel and monument. **$750,000.**

Pa., Morrisville—SCHOOLS—Morrisville School Bd., Morrisville, high school addn. Approx. **$300,000;** elementary school for western sect. of Boro, **$500,000.** CD 12/7/44.

Pa., Neshaminy—HIGH SCHOOL—Neshaminy Joint School Bd., Langhorne, plans completed by Berninger, Haag & D'Entremont, 308 York Rd., Jenkintown, Junior-Senior High School. Approx. **$500,000.**

▲ **Pa., Plymouth Meeting**—HIGH SCHOOL—State Public School Auth., 1400 N. Cameron St., Harrisburg, plans by Davis, Dunlap & Carver, 1717 Sansom St., Phila., joint high school for Plymouth-Whitemarsh Joint School Bd., Plymouth Meeting. **$1,823,617.** CD 11/12/47.

▲ **R. I., Providence**—PARKING GARAGE—Providence City Council, City Hall, plans by Lucio Carlone, 57 Eddy St., 3 story open deck parking garage, north edge of downtown shopping center. **$1,000,000.** Ramp Building Corp., 230 Park Ave., New York 17, N. Y. consult. engrs. CD 1/10.

▲ **Tenn., Memphis**—SCHOOLS—Bd. Educ., 317 Poplar St., auditorium bldg., East High School, **$300,000;** Kingsbury, White Stations and Sherwoods Schools addns., Approx. **$500,000;** Hamilton High School (Negro) addns., imprvs., Wilson, south of South Parkway, **$1,387,085;** Gregg School addns., Jackson St., near National Cemetery, Approx. **$300,000;** plans by E. L. Harrison, 81 Madison Bldg., Negro School, Cincinnati and Dunn Sts. in South Memphis, **$300,000;** brick school, Tutwiler and Perkins Sts. **$300,000.** Wm. Fowler, city engr.

▲ **Tex., Dallas**—HOUSING—Dallas Housing Auth., 2525 Lucas Dr., 400 low-cost housing units in Southern Dallas, **$3,000,000;** 300 low-cost housing units in East Dallas, **$2,250,000.** CD 12/2/49.

Tex., Edinburg—HOSPITAL—Hidalgo Co., M. D. Richardson, judge, Edinburg, hospital wing and bldg. **$600,000.**

Tex., Waco—PRISONERS HOUSE—McLennan Co., Court House, Waco, prisoners house, **$716,177.**

▲ **Wis., Madison**—OFFICE—State, State Office Bldg., 1 W. Wilson St., plans by R. C. Kirchoff, state archt., 6 story state office bldg. addn. **$2,500,000.**

▲ **Wis., Milwaukee**—UNIVERSITY—Bd. Regents, University of Wisconsin, Madison, plans by G. J. DeGelleke, 152 W. Wisconsin Ave., Zone 3, 3 or 4 story, bsmnt., 75x120 ft., university addn. **$1,000,000.** CD 3/10/48.

▲ **Ont., Aurora**—HOME—York County Council, 6 Adelaide St. E., Toronto, old folks home on Highway 11, north of here. **$1,000,000.**

Que., St. Laurent—SCHOOL—School Comn., L. Deguire, secy., plans by G. LeBorgne, 4437 Oxford Ave., Montreal, school, Loudres St. Approx. **$350,000;** plans by R. Dufresne, 2760 Van Horne Ave., Montreal, 2 story, bsmnt., school, Decelles Ave., Approx. **$500,000.**

COMMERCIAL BUILDINGS

▲ **Colo., Denver**—HOSPITAL—Spears Chiropractic Sanitarium, E. 10 Ave. and Jersey St., Denver, Colo., 4 and 5 story H-shaped, 200x270 ft., four wings, brick, steel chiropractic hospital, **$14,000,000.** Walter Simon, 1922 E. 18 Ave., consult. engr.

Ill., Naperville—LIBRARY—North Central College and Evangelical Theological Seminary, Naperville, plans by Fugard, Burt, Wilkinson & Orth, 520 N. Michigan St., Chicago, Zone 11, library bldg., **$500,000. 12/14.**

▲ **Ind., South Bend**—SCHOOL—Holy Cross Catholic Parish, 1520 Vasser St., plans by Gaul & Vosen 228 E. Superior St., Chicago, 11, Ill., Catholic High School, **$1,000,000.**

Mass., Framingham—COUNTRY CLUB—General Products Co., Clifford A. McBride, pres., Central Falls, R. I., Motor Inn-Framingham Country Club, **$500,000.**

▲ **Mich., Birmingham**—HOUSING—Cranbrook Development Co., Louis Savage, 1216 Penobscot Bldg., Detroit, Mercier Farm Development, incl. 155 housing units, Maple, Lahser and Cranbrook Rds. **$2,000,000.**

Mich., Dearborn—HOUSING—The Lundblad Co., 4070 W. Fort St., Detroit, plans by Rober C. Lundblad, 4070 W. Fort St., Detroit, 50 single houses, **$500,000.**

▲ **Mich., Detroit** — HOUSING — Douglas Homes, Inc., 17325 W. McNichols St., 250 single brick houses, **$2,250,000.**

▲ **Mich., Detroit**—HOUSING—Kay & Saltz, Inc., Allen A. Saltz, 10057 Southfield Rd., 300 single brick homes, **$3,000,000.**

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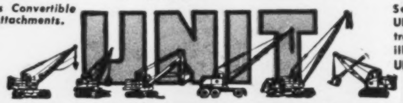

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▲ **Mich., Detroit**—HOUSING—Miller Homes, Inc., 13535 Livernois St., 300 brick homes, northwestern and eastern sections, **$3,000,000.**

Mich., Grosse Pointe (Br. Detroit)—RESIDENCES—Cox & Baker, 19511 Mack St., 30 brick homes, **$900,000.**

Neb., Omaha—HOSPITAL—Methodist Hospital, 3612 Cuming St., plans by L. J. Dworak, 651 J. E. George Blvd., 6 story hospital addn. **$500,000.**

▲ **N. J., Trenton**—APARTMENT—Owner, c/o Agent Hyman Rothbart, 342 Madison Ave., New York, N. Y., apartment, Wert and Olden Aves., in Hamilton Twp., Approx. **$2,000,000.**

▲ **O., Willowick**—HOUSING—Sunshine Realty Co., c/o Frank H. Feingold, atty., Society for Savings Bldg., 145 Public Square, Cleveland, 800 homes in Bayridge Allotment. **$10,000,000.**

▲ **Tex., Houston**—DWELLINGS—L. W. Helms, 71 E. Burgess St., plans by F. Perry Johnston, 3908 Main St., Proj. 1, 50 frame dwellings, concrete slab fdn., **$450,000**; Proj. 2, 50 cedar shake exterior dwellings, concrete slab fdn. **$475,000**; Proj. 3, 50 frame with brick trim dwellings, concrete slab fdn, **$490,000**; Proj. 4, 50 cedar shake, frame with brick trim dwellings, concrete slab fdn., **$500,000** all foregoing in Braeburn Terrace.

▲ **Tex., Houston**—DWELLINGS—Dr. M. W. Hoover, 4831 Griggs Rd., 100-low cost dwellings, **$500,000**; 100 random type dwellings, $650,000; 100 medium-priced dwellings, **$600,000.**

▲ **Tex., Kingsville**—HOUSING—Dpt. Navy, 18 St. and Constitution Ave. N. W., Wash. 25, D. C., construct, manage, finance, 297 housing units for military personnel. **$2,227,500.**

Va., Charlottesville—HOSPITAL—Martha Jefferson Hospital, c/o W. E. Stainback, archt., Charlottesville, hospital addn. Approx. **$500,000.**

W. Va., Charleston—CLASSROOM—Morris Harvey College, 2300 MacCorkle Ave. S.E., rebuild classroom bldg. **$500,000.**

▲ **Wis., Milwaukee**—COMMUNITY CENTER—Jewish Community Center, 1444 N. Prospect St., Milwaukee, Zone 32, plans by M. Meyer & Assocs., 424 E. Wells St., Zone 2, 2 story, bsmnt. community center, **$1,300,000.** CD 6/12/47.

▲ **Alaska, Anchorage**—HOUSES—Northern Development Co., Anchorage, 200 houses in Oilwell Rd. area, **$1,500,000.**

INDUSTRIAL BUILDINGS

▲ **Calif., Azusa**—FACTORY—Kevo Products Co., 900 W. Foothill Blvd., plans by Van Lee Schmidt, 124 W. 4 St., Los Angeles, factory. **$3,000,000.** CD 8/4/50.

▲ **Colo., Denver**—BUS TERMINAL—National Trailways Bus System, 17 and Tremont Sts., plans by Alfred Grant, 1679 Broadway, bus terminal, etc. 17 St. and Broadway, **$1,500,000.** CD 5/29.

Me., Bridgton—MILL—Abbot Worsted Co., Graniteville, Mass., worsted cloth mill. **$450,000.** Stewart Assoc., Inc., 698 Mass. Ave., Cambridge, Mass., consult. engr.

Mich., Battle Creek—PLANT—Federated Publications, Inc., Battle Creek, newspaper plant, **$728,000.**

▲ **Pa., Phila.**—PLANT—The Budd Co., 2450 Hunting Park Ave., mfg. plant expansion on 36 acres on Bustleton Ave. Approx. **$1,000,000.**

Tex., Houston—FACTORY—Texas Brine Corp., 2502 Fannin St., brine, wells, pipe lines. **$500,000.**

Tex., Houston—FACTORY—United Salt Co., 2502 Fannin St., brine, wells, pipe lines. **$500,000.**

Utah, Salt Lake City—PLANT—Lucerne Milk Co., Tribune Bldg. Oakland, Calif., plans by W. J. Monroe Jr., Atlas Bldg., 4,000 gal. milk processing plant. **$450,000.**

W. Va., Charleston—TERMINAL—Union Truck Terminal, 3500 Washington St., rebuild truck freight terminal. Approx. **$750,000.**

▲ **Man., Morden**—PLANT—Canadian Canners Ltd., 44 Hughson St. S., Hamilton, Ont., 1 story, 40,000 sq. ft., vegetable canning plant, **$1,000,000.**

▲ **Que., Shawinigan Falls**—PLANT—Canadian Resins & Chemicals Ltd., 600 Dorchester St. W., Montreal, 2nd unit plant, **$2,500,000.**

UNCLASSIFIED

▲ **Calif., Burbank**—TELEVISION STUDIOS—National Broadcasting Co., Sunset and Vine Sts., Los Angeles, two television studios, Alameda Ave. and California St., **$1,000,000.** Austin Co., 777 E. Washington Blvd., Los Angeles, consult. engr.

Oklahoma—TRASMISSION LINE—Oklahoma Gas & Electric Co., 321 N. Harvey St., Oklahoma City, Zone 2, 35 mi. 66 kv transmission line from Enid to Guthrie, Garfield Co. **$400,000**; 25 mi. 66 kv transmission line from Harrah to Meeker, Oklahoma Co. **$200,000**; 20 mi. 66 kv transmission line from Edmond to Guthrie, Oklahoma Co. **$175,000.** R. F. Danner, c/o owner, engr.

South Carolina—RURAL DISTRIBUTION LINES—Black River Electric Co-operative, Sumter, rural distr. lines, Sumter Co., etc. **$450,000.** Southern Eng. Co., 1000 Crescent Ave., N. E., Atlanta, Ga., consult. engr.

Alta., Cold Lake—POWER LINE—Canadian Utilities Ltd., 10529 Jasper Ave., Edmonton, power line to service the proposed airport, **$850,000.**

CONSTRUCTION REPORTS-Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
February 19 Massachusetts

Me., York Harbor—B.A. 2/19—Trustees York Sewer Dist., York Village, 7,200 ft. 8- to 12-in. gravity sewer and force main, short sands pumping station, Bayhaven Treatment Plant. $150,000. Plans deposit $20. H. I. & E. C. Jordan, 36 Exchange St., Portland, engrs. CD 10/24.

BIDS ASKED—BUILDINGS

▲ **Mass., Lawrence**—HOUSING—B.A. 3/5—Lawrence Housing Auth., 56 Melvin St., housing, Proj. PHA Mass 23-2, Adams St. Plans deposit $100. Desmond & Lord, 6 Beacon St., Boston, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Associated Constr. Co., 1010 Wethersfield Ave., Hartford, Conn., LB, **$864,000**, sewage treatment plant, Pitkin St., East Hartford, HARTFORD, CONN. Bd. Contr. & Supply, Metropolitan Distr., 115 Broad St., Hartford, Conn. Bids Jan. 31. CD 12/18.

BUILDINGS

LOW BIDS AND CONTRACTS

Bathelt Constr. Co., 50 Appleton St., Holyoke, Mass. LB **$911,000**. DINING HALL, at University of Masachusetts, No. 7918-79-U-304, AMHERST, MASS. State, University of Mass., Amherst, Mass. Bids Feb. 1. CD 1/3.

▲ **W. J. Megin, Inc.**, 51 Elm St., Naugatuck, Conn., CA **$1,689,935**, HOSPITAL west wing addn. and alterations Watertown Ave. and Robbins St., WATERBURY, CONN. Waterbury Hospital, Robbins St., Waterbury, Conn. Bids Dec. 18, awarded Jan. 30. CD 1/4, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
February 27 New York

New York—B.A. 2/27—At office Henry A. Cohen, dir. Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, landscaping 9.59 mi. Ashokan-Blvd. (North Side), S.H. 47-5, Kingston-West Hurley, S.H. 5173, Contr. R.C. 52-19, Ulster Co. $16,000. Plans deposit $15; adv. ENR 2/14.

Pa., Union City—B.A. 3/6—Union City Boro, Union City, sewage disposal plant, filtration plant, water reservoir, lines, tanks. $600,000. Plans deposit $20 each sect. Hill & Hill, 8 Gibson St., North East, engrs.

BIDS ASKED—BUILDINGS

N. Y., Yonkers—SCHOOL—B.A. 2/20—Bd. Educ., Administration Bldg., 138 Broadway, P. S. 25 addn. $450,000.

▲† **Md., Fort George G. Meade**—BARRACKS, etc.—B.A. 2/28—U. S. Eng., 24 St. and Maryland Ave., P. O. Box 1715, Baltimore, Zone 3, barracks buildings, various facilities, imprvs., Eng. 18-020-52-27, $7,800,000, Rummel, Klepper & Kahl, 1021 N. Calvert St., Baltimore, and Fenton & Lichtig, Menefee & Moehle, 2023 Maryland Ave., Baltimore, engrs. and archts. Extended date. CD 1/16.

▲ **Pa., Phila.**—HOUSING—B.A. 3/6—Phila. Housing Auth., 42 S. 15 St., Norris Homes $2,923,492. Walter Antrim & Charles G. Etter, 117 S. 17 St., archts. Gibson & Kline, 117 S. 17 St., engrs. CD 12/20.

▲ **Pa., Pittsburgh**—HOUSING—B.A. 3/11—Pittsburgh Housing Auth., City County Bldg., 57 bldgs., 1,069 family, row type and apartments, $13,425,000. Plans deposit $100. Marks, Fisher & Simboli, Hardy Hays Bldg., archts.

▲ **Pa., Phila.**—HOUSING—B.A. 3/20—Phila. Housing Auth., 42 S. 15 St., 308 units Diamond housing, 22 to 25 Sts., Norris, Dauphin and Penna. R. R. $3,500,000; 814 unit Diamond Area Housing, 22-25 Sts., Norris, Dauphin Sts., and Penna R. R. Wigham & Tilden, 1601 Chestnut St., archts. CD 3/2/51.

N. J., Florence—HOUSING—B.A. 3/28—Florence Housing Auth., Florence, 50 unit housing. $500,000. Henry W. Petty, 141 Chestnut St., Moorestown, archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

J. Rich Steers, 17 Battery Pl., New York, N. Y., LB **$2,058,093**, sub-structure for Route 25 bridge over Hackensack River between Jersey City and Kearny, Hudson Co. Bids Jan. 29. CD 1/11.

▲ **J. L. Mc Ilvaine Co.**, 925 12 St. N. W., Wash., D. C., LB, **$1,776,798**, Interceptor Sewer No. C, along Christiana Creek, WILMINGTON, DEL. **City**, City Hall, Wilmington, Del. Bids Jan. 29. CD 12/12.

BUILDINGS

LOW BIDS AND CONTRACTS

Foss, Halloran, Nahr, Inc., 29-28 41 Ave., Long Island City, N. Y., LB **$745,000**, foundations and appurtenances for Mariners Harbor HOUSES (Proj. No. NY 5-20) in area bounded by Grand View Ave., Roxbury St., Lockman Ave. and Continental Pl., Richmond Boro, MARINERS HARBOR, N. Y. New York City Housing Auth., 63 Park Row, New York 7, N. Y. Bids Feb. 5. CD 1/17.

▲ **John A. Sarubbi**, 415 64 St., West New York, N. J., CA, **$10,000,000**, three COLLEGE buildings, SOUTH ORANGE, N. J. Seton Hall College, Administration Bldg., S. Orange Ave., South Orange, N. J.

Guy Miller, 1616 Robinson Blvd., McKees Rocks, Pa., CA. **$527,762**, HOUSING, 8 bldgs., 2 story, 26x137 ft., 26x108 ft., 26x90 ft., 26x133 ft., 26x83 ft., 26x125 ft., brick veneer constr. Proj. 608, MCKEES ROCKS, PA. Allegheny Co. Housing Auth., County Bldg., Pittsburgh, Pa. CD 11/29, under LB.

▲ **Pennway Homes**, Western Savings Fund Bldg., Phila., Pa., Separate Contracts. **Approx. $1,250,000**. RESIDENTIAL DEVELOPMENT, Whittaker Ave. and Pennway St., PHILA., PA.

Frank H. Wilson Co., 125 Coulter Ave., Ardmore, Pa., CA. **$724,235**. general constr. Penn Village HOMES, POTTSTOWN, PA. Montgomery Co. Housing Auth., Pottstown, Pa. Bids Dec. 14. CD 1/2, under LB.

Curtis Bailey Co., 69 and Walnut Sts., Upper Darby, Pa. Separate Contracts. **$600,000**. RESIDENTIAL DEVELOPMENT, Orchard Way, etc., UPPER MORELAND TWP. (Willow Grove P. O.), PA.

▲ **Adam B. McClatchy**, 69 and Walnut Sts., Upper Darby, Pa., Separate Contracts, **$15,000,000**, RESIDENTIAL DEVELOPMENT, NEWARK, DEL. Erling Wenge; McClatchy Bldg., Upper Darby, Pa., archt.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **NORTH CAROLINA**—B.A. 3/12—U. S. Eng., foot of Front St., Norfolk, Va.,
3.1 mi. of secondary road, access highway, right bank John H. Kerr Reservoir, Va., N. C. relocation, Va. Secondary No. 712. $100,000-$500,000.

BIDS ASKED—BUILDINGS

▲ **W. Va., Phillippi**—HOSPITAL—B.A. 2/28— Broadus Hospital, Phillippi, 3 story, bsmnt., T-shaped, brick, block general hospital, $1,500,000. Plans deposit $200. Tucker & Silling, 314 Masonic Bldg., Charleston, archts. CD 1/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **P. & W. Constr. Co.**, Hurt Bldg., Atlanta, Ga., LB, **$294,570** ammunition and ATO storage facilities at Hunter Air Force Base, ENG 09-133-52-25, SAVANNAH, GA. U. S. Eng., Post Office Bldg., Savannah, Ga. Bids Jan. 29. CD 1/28.

H. R. Coker, Sylacauga, Ala., LB, **$301,162**, filter plant and raw water pumping station, TALLADEGA, ALA. City, Talladega, Ala. Bids Jan. 29. CD 1/18.

BUILDINGS

LOW BIDS AND CONTRACTS

F. E. Steber, c/o James W. Voorhies, archt., 629 N.E. 64 St., Miami, Fla., Owner Builds, **$750,000**. 60 RESIDENCES, COCOA, FLA.

▲ **Gaines Constr. Co.**, 5232 W. Flagler St., Miami, Fla., CA, Approx. **$1,000,000**, 175 RESIDENCES, MIAMI, FLA. G. W. Four, Inc., c/o contractor.

Southeastern Builders, 1750 S.W. 3 Ave., Miami, Fla., CA, **$400,000**, 50 RESIDENCES, MIAMI, FLA. Fred Homes, Inc., c/o contractor.

L. B. Priester & Son, Box 4456, Jackson, Miss., CA **$522,750**, Montebello White Elementary SCHOOL;

J. E. Pyle, P. O. Box 1679, Little Rock, Ark., CA **$534,089**, combination grade and high SCHOOL for NEGROES, NATCHEZ, MISS. Natchez Municipal Separate School Dist., Natchez, Miss. CD 2/5, under LB.

▲ **R. P. Farnsworth & Co., Inc.**, 1515 S. Salcedo St., New Orleans, La. LB **$6,182,000**. HOUSING, Proj. LA 1-12, NEW ORLEANS, LA. New Orleans Housing Auth., 1111 Tulane Ave., New Orleans, La. Bids Jan. 31. CD 1/9.

▲ **Southern Builders**, Box 1815, Shreveport, La. LB **$1,086,000**. Nursing SCHOOL, at Confederate Memorial Medical Center, SHREVEPORT, LA. State, Div. Admin., Capitol Annex, Baton Rouge, La. Bids Jan. 29. CD 12/31.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
February 20 Michigan
STREETS AND ROADS
February 20 Michigan

† **O., Columbus**—APRON PAVING—B.A. 3/6—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., apron paving at Lockbourne Air Force Base, Serial No. ENG 46-022-52-102. CD 1/18.

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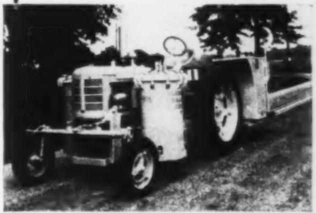

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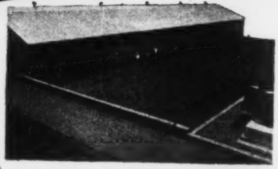

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HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **W. B. Gibson Co.,** Warren, O., CA. **$316,409,** warehouse, communications bldg. and training aids bldg. at Youngstown Municipal Airport, Serial No. ENG 46-022-52-82, YOUNGSTOWN, O. U. S. Eng. 237 Fourth Ave., Huntington 18, W. Va. Bids Dec. 18, awarded Jan. 26.

INDIANA—State Hy. Comn., State House Annex, Indianapolis, Zone 4,

Robert H. King, Danville, Ind., LB, **$278,889,** est. $343,269, 3 span 198 ft. continuous steel beam bridge 30 ft. roadway, two 2 ft. walks, 0.223 mi. approach grading, c. conc. pavement over Big Pine Creek, S.E of Templeton, Benton Co.;

C. B. Cochran, 5003 Boulevard Pl., Indianapolis, Ind., LB **$112,677,** est. $130,428, 1 span ,50 ft. rein.-con. arch bridge, 69 ft. roadway; 1 span 36 ft. rein.-con. archt bridge 69 ft. roadway 0.066 mi. and 0.06 mi. approach grading and concrete base and b. conc. surf. respectively both over State Ditch, S.W. of Maywood, Marion Co.;

Moellering Constr. Co., 241 Murray St., Fort Wayne, Ind., LB, **$426,721,** est. $630,370, 6 span 281 ft. continuous steel beam and rein.-con. overhead bridge over Wabash Ry., two 27 ft. dual lanes, two 2 ft. walks, 0.632 mi. approach grading, east of Fort Wayne, Allen Co.;

R. H. Allen, 804 N. 5 St., Vincennes, Ind., LB, **$72,609** est. $101,031, 2 span 80 ft. rein.-con. girder bridge, 28 ft. roadway, two 2 ft. walks, 0.057 mi. approach grading and c. conc. pavement over W. Fork of Pigeon Creek, 1 mi. north of junction with State Rd. 68 Rural District, Gibson Co. Bids Jan. 29. CD 1/11.

BUILDINGS

LOW BIDS AND CONTRACTS

Van Etten Bros., Inc., 11024 S. Michigan Ave., Chicago, Ill., **$350,000,** 54,000 sq. ft. WAREHOUSE with OFFICE, CHICAGO, ILL. Mid-City Wholesale Grocers, 1950 S. 52 Ave., Cicero, Ill. Fox & Fox, 30 N. La Salle St., Chicago, 2, Ill., archts. Awarded Jan. 10.

Inland Constr. Co., 134 N. La Salle St., Chicago, 2, Ill., CA, **$350,000,** 1 story, 51,000 sq. ft. FACTORY, 3129 W. 43 St., CHICAGO, ILL. Marvel Metal Products Co., 1100 S. Central Park Ave., Chicago, Ill. A. Epstein & Sons, Co., 2011 Pershing Rd., Chicago, 9, Ill., archts. Awarded Jan. 16.

▲ **Turner Constr. Co.,** 105 W. Adams St., Chicago, 3, Ill., CA, Approx. **$2,000,000,** two 12 story APARTMENTS, on block between 33 Place and 34 St., Cottage Grove and Rhodes Aves., CHICAGO, ILL. New York Life Insurance Co., 51 Madison Ave., New York 10, N. Y. Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., archts.

General Builders Co., 300 N. 9 St., Springfield, Ill., LB, **$392,500,** constr. 50 DWELLING UNITS on site of Proj. Ill. 42-1 and other incidental to completion, HAVANA, ILL. Mason County Housing Auth., Howard S. White, exec. dir. 129 S. Orange St., Havana, Ill. Bids Jan. 24. CD 12/29.

Lieber Corp., 18708 Ecorse St., Allen Park, Mich. Owner Builds. **$480,000.** 40 brick HOMES, Allen Park Development, ALLEN PARK, MICH.

Rose-Hill Building Co., 13324 W. Seven Mile Rd., Detroit, Mich., **$350,000.** 40 single HOMES, 7 mile Rd. sect., DETROIT, MICH. Rose-Hill Realty, Inc., 13324 W. Seven Mile Rd., Detroit, Mich.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES
February 22 Iowa

STREETS AND ROADS
February 22 Iowa

† **Ia., Sioux City**—HANGARS, etc.—B.A. 2/19—U. S. Eng., 1709 Jackson St., Omaha, Neb., rehabilitation hangars and operations bldgs. at Sioux City Municipal Airport, Inv. 52-58. CD 12/7.

† **Okla., Norman**—REHABILITATION WORK—B.A. 2/20—U. S. Govt. Officer in Charge of Construction, Bldg. 16, Naval Station, New Orleans, La., rehabilitation work at Naval Air Technical Training Station, Cont. No. NOY 71877. $300,000.

▲† **Colorado**—B.A. 3/11—Bureau Reclamation, Dpt. Interior, Loveland, constr. St. Vrain Supply Canal Station 10 plus 90.5 to Station 520 plus 75, Colorado Big Thompson Proj., in vicinity of Lyons, Spec. DC 3657. L. N. McClellan, ch. engr.; adv. ENR 2/14. CD 11/30.

BIDS ASKED—BUILDINGS

Tex., Rockport—HIGH SCHOOL—B.A. 2/26—Aransas County Independent School Dist., Rockport, high school, $325,000. L. A. Evans & O. Roy Abbott, Bevly Bldg., Corpus Christi, archts. CD 1/15, under LB.

▲ **Tex., Galveston**—HOSPITAL—B.A. 2/27—Bd. Regents, University of Texas, 205 Main Bldg., Austin, 60-bed tuberculosis hospital. $1,000,000. CD 6/6 under LB.

▲ **Tex., Houston**—DENTAL SCHOOL—B.A. 3/26—Bd. Regents, University of Texas, 205 Main Bldg., Austin, dental school for Texas Medical Center, $6,450,000. Plans deposit $100. MacKie & Kamrath, 2713 Ferndale St., archts. W. P. Moore, 4605 Montrose St., and R. L. Jenkins, 4316 Blossom St., engrs. CD 12/27.

(Continued on page 251)

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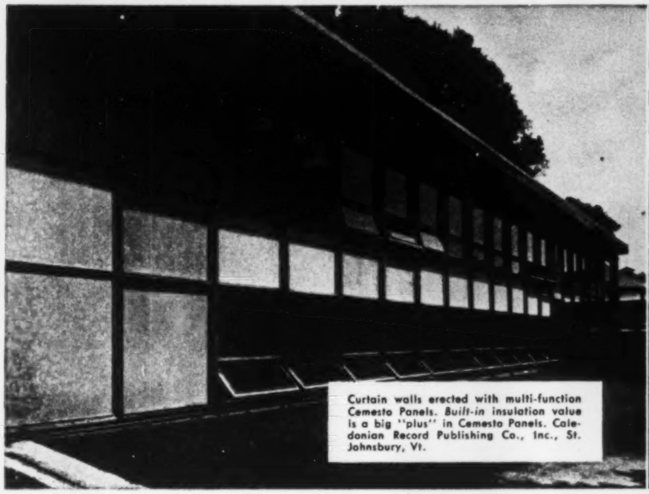

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LUKENS STEEL COMPANY

WORLD'S LEADING PRODUCER OF SPECIALTY STEEL PLATE • PLATE SHAPES • HEADS • CLAD STEELS

(Continued from page 248)

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Lippert Constr. Co., 2800 N. Santa Fe St., Oklahoma City 5, Okla. CA **$346,478.** sewage disposal plant, near Truman Rd. and Lake City Rd.;

Koch & Freer Constr. Co., 24 Hy. and Osage St., Independence, Mo. CA **$427,954.** Spring Branch Main, Golden Acres Main, Mill Creek Main, Kiger Main, and road surf.;

Knoop Constr. Co. and Griffin Constr. Co., Dwight Bldg., Kansas City 6, Mo., CA **$127,836.** 2 pumping stations, attendant pressure lines, near Dickinson Lakes, Crackerneck Rd. and Old Lee's Summit Rd., INDEPENDENCE, MO. City, c/o Mayor Robt. P. Weatherford, City Hall, Independence, Mo. Grand Total $902,-268. Bids Jan. 14, awarded Jan. 28. CD 1/21, under LB.

† **Patton-Tully Transportation Co.**, 1242 2 St., Memphis, Tenn., LB, **$537,111,** revetment work, etc. on right and left descending banks of Arkansas River Inv. 52-109, Jefferson Co., ARKANSAS. U. S. Eng., P. O. Box 60, Vicksburg, Miss. Bids Jan. 31. CD 1/15.

† **Buckinham Lumber Co.**, Rapid City, S. D., CA. **$475,134,** clearing timber from site at Fort Randall Dam and Reservoir Proj., near Lake Andes, SOUTH DAKOTA. U. S. Eng., Pittock Block, Portland, Ore. CD 5/25/44.

City, Alice, Tex., cancelled bids to have been opened Feb. 19, drainage, ALICE, TEX. **$365,000.** CD 1/28.

E. E. Farrow, 6109 Forest Park Rd., Dallas, Tex., LB **$388,876,** water mains, Buethurum St., DALLAS, TEX. City, City Hall, Main and Harwood Sts., Dallas, Tex. Bids Jan. 29. CD 11/21.

† **E. E. Cloer Constr. Co.**, 2825 Crockett St., Fort Worth, Tex., LB, **$369,334**, est. $401,279, headquarters and supply bldgs. at Camp Wolters Air Force Base, ENG 41-443-52-13, MINERAL WELLS, TEX. U. S. Eng., 1127 Texas and Pacific Bldg., Fort Worth, Tex. Bids Jan. 25. CD 1/22.

Grayson Co., Sherman, Tex., indefinitely postponed 13.954 mi. grading, flexible base, c. conc. pavement, wid'n and hot mix b. conc. pavement U. S. Hy. 75, Sherman to Denison and from near Howe to Sherman, SHERMAN, TEX. Est. **$145,000.** CD 11/7.

Warren Petroleum Co., Natl. Bank of Tulsa Bldg., Tulsa Okla., Own Forces. **$150,000.** drilling and excavating underground reservoir to store liquefied petroleum gas, TYLER, TEX. CD 1/30.

BUILDINGS

LOW BIDS AND CONTRACTS

Standard Constr. Co., 250 Builders Exchange Bldg., Minneapolis, Minn. CA **$170,000.** general contract 1 story, 120x200 ft. FACTORY, 82 St. and Pleasant

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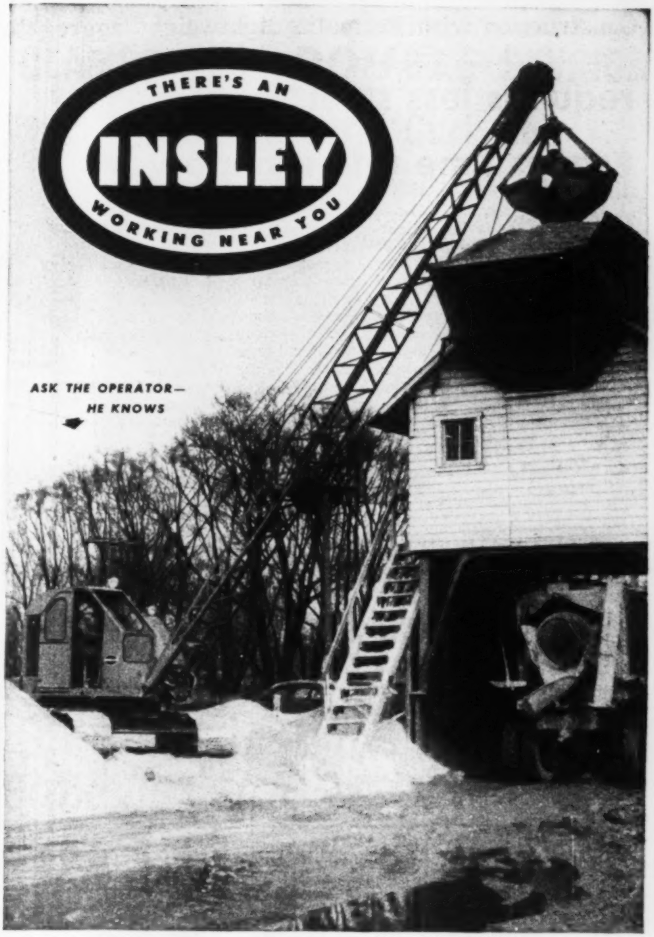

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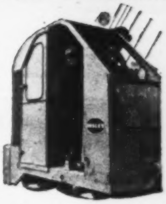

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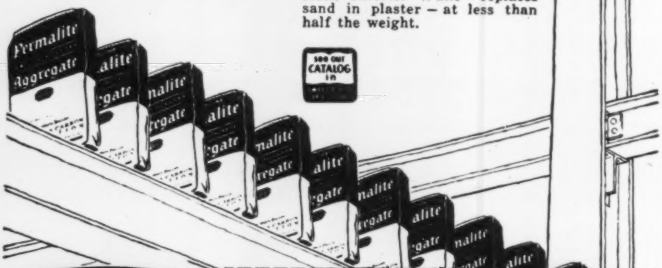

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Ave, Bloomington, MINNEAPOLIS, MINN. Toro Mfg. Co., 3042 Snelling Ave., D. M. Lilly, pres., Minneapolis, Minn. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, Minn., archts.

Henkel Constr. Co., Mason City, Ia., CA, **$389,800.** general contract Senior High SCHOOL, VINTON, IA. Bd. Educ., Consolidated School Dist., Vinton, Ia. Bids Jan. 15.

Tri-States Constr. Co., Hall Bldg., Little Rock, Ark., CA, **$474,268**, HOUSING, ARKADELPHIA, ARK. Arkadelphia Housing Auth., Arkadelphia, Ark. Bids Jan. 25. CD 12/31.

Robert Meurer, Glover Bldg., Little Rock, Ark., Owner Builds, **$750,000**, 64 RESIDENCES, LITTLE ROCK, ARK.

▲ **Wallace E. Johnson**, 3169 Johnson Ave., Memphis, Tenn., Owner Builds, **$2,500,000**, 274 RESIDENCES, known as Memphis View Homes, WEST MEMPHIS, ARK. CD 12/5.

A. S. Battiato Constr. Co., 4929 Grand Ave., Omaha, Neb. Owner Builds. Approx. **$400,000.** 40 DWELLINGS, OMAHA, NEB. J. C. Jackson, 513 S. 20 St., Omaha, Neb., archt.-engr.

▲ **Missouri Valley Constr. Inc.**, 1932 Harrison St., Amarillo, Tex., CA. Approx. **$2,300,000.** GENERATING unit, AMHERST, TEX. Southwestern Public Service Co., 3 and Polk Sts., Amarillo, Tex.

Thomas E. Ryan & Co., 801 Commerce St., Houston, Tex., Own Forces. **$375,000.** 50 DWELLINGS, FORT WORTH, TEX. CD 4/17/51.

Texas Power & Light Co., Interurban Bldg., Dallas, Tex., Own Forces. **$375,000.** 5000 kw. electric generating PLANT unit, GAINESVILLE, TEX. CD 1/18.

Bob DePuy, Hondo, Tex., Own Forces. Approx. **$300,000.** DUPLEXES, HONDO, TEX. CD 1/23.

Rambo Constr. Co., 1500 S. Main St., Fort Worth, Tex., CA. **$365,000.** 3 story, bsmnt. WAREHOUSE, HOUSTON, TEX. Herrin Transportation Co., 2300 Walker St., Houston, Tex. Francis J. Niven & Assoc., 3908 Main St., Houston, Tex. Awarded Jan. 25.

C. O. Beeler, Riverside Development Co., 5047 Marietta St., Houston, Tex. Own Forces. **$380,000.** 10 DWELLINGS. Part of Proj. 3, PASADENA, TEX. CD 2/23/51.

Armco Steel Corp., Commerce Bldg., Houston, Tex. Own Forces. Approx. **$750,000.** construct unit of iron ore mining PLANT, RUSK, TEX. CD 2/14/51.

West Texas Utilities Co., 15 E. Beauregard Ave., San Angelo, Tex., Purchases, Day Labor, Separate Contracts. Approx. **$335,000.** electric POWER PLANT unit, SAN ANGELO, TEX. CD 1/28.

Quincy Lee Constr. Co., 211 W. Olmos Dr., San Antonio, Tex., Owner Builds. Approx. **$375,000.** 54 DWELLINGS, SAN ANTONIO, TEX. CD 1/30.

G. W. Mitchell, 811 American Hospital & Life Bldg., San Antonio, Tex., CA. **$310,000.** STUDENT UNION bldg., SAN ANTONIO, TEX. Trinity University, W. Ashby St., San Antonio, Tex. Harvey P. Smith, NBOC Bldg., B. Cocke, 3501 Broadway, O'Neil Ford, 228 E. Martin St. all San Antonio, archts. CD 3/21/51.

† **Mellwin Constr. Co.**, 35 S. Fox St., CA, **$386,236** CAFETERIA bldg. and GARAGE bldg., Rocky Flats Plant, near BOULDER, COLO. U. S. Atomic Energy Comn., **P. O. Box 5400, Albuquerque**, N. M. Bids Jan. **25. CD 12/19.**

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

February 27, 28 California

Wash., Medical Lake—B.A. 2/21—State Dpt. P. Institutions, Olympia, 55x33 ft. primary sewage disposal plant and 10,000 ft. 8- to 12-in. cement-asbestos vitr. clay and c.i. sewers at Lakeland Village, Approx. $60,000. Plans deposit $35. Parker, Hill & Ingman, 1728 E. Madison St., Seattle, engrs.

† **Utah, Tooele** — TRAILER CAMP FACILITIES — B.A. On Or About 2/26—U. S. Eng., P.O. Box 2852, Bldg. 97-A, Fort Douglas, exten. trailer camp facilities, "Fox" area, Dugway Proving Ground, Inv. No. ENG 04-203-52-94.

† **Calif., Oakland**—RAILROAD TRACKS—B.A. 2/26—Post Engr., Oakland Army Base, Building 251, Zone 14, align. and surfacing Railroad Tracks 2 and 3, Dock 6½, Oakland Army Base. Bid No. 04-113-52-11.

† **Oregon**—B.A. 2/26—U. S. Eng., 628 Pittock Block, Portland, Zone 5, mfg., del. f.o.b. Lookout Point Dam, 6 penstock stop log guides and 3 stop log seal frames, complete with appurtenant parts, Serial No. CIVENG 35-026-52-152.

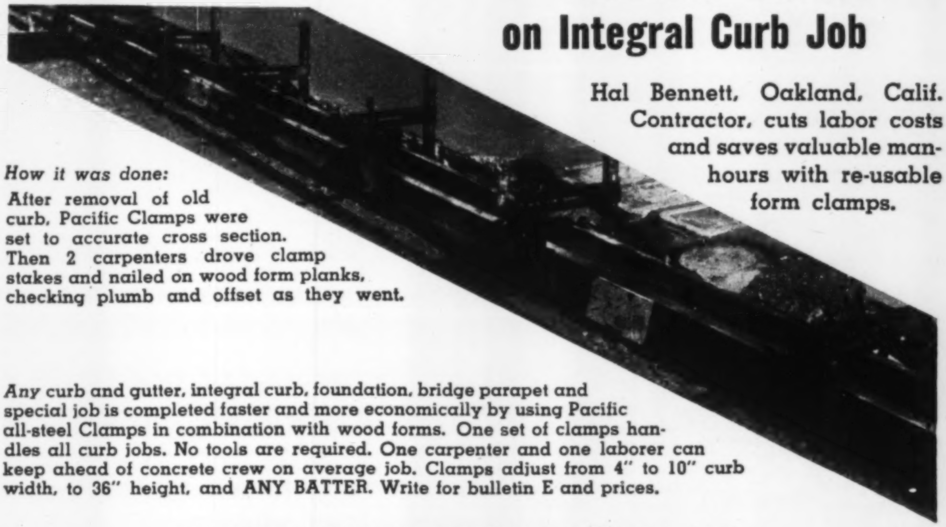
† **Utah, Tooele**—B.A. On Or About 3/4—U. S. Eng., P.O. Box 2852, Bldg. 97-A, Fort Douglas, grading storage area and bit. surf., Tooele Ordnance Depot, Inv. No. ENG 04-203-52-93.

† **Washington**—B.A. 3/13—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, f.o.b. cars shipping point or f.o.b. cars Eltopia, motor control equipment assembly, control switch for Ringold Pumping Plant, Columbia Basin Proj., Spec. DS 3652. L. N. McClellan, ch. engr.

† **California**—CIRCUIT BREAKERS, etc.—B.A. 3/18—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del.

(Continued on page 254)

PACIFIC All-Steel CLAMPS mean DOUBLE SAVINGS on Integral Curb Job



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How it was done:
After removal of old curb, Pacific Clamps were set to accurate cross section. Then 2 carpenters drove clamp stakes and nailed on wood form planks, checking plumb and offset as they went.

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(Continued from page 252)

f.o.b. cars shipping point or f.o.b. cars Sacramento, circuit breakers, disconnecting switches, etc. for Elverta Sub-station, Central Valley Proj., Spec. DS 3655. L. N. McClellan, ch. engr.

BIDS ASKED—BUILDINGS

Calif., Eureka—HOUSING—B.A. 3/3—Eureka Housing Auth., Henderson and Spring Sts., housing, incl. 40 bldgs., CAL 25-1, north of Harris and east of Prospect Sts. $750,000. Plans deposit $50. Frank T. Georgeson, 537 G St., archt. CD 1/14.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ † **Macco Corp.**, 14409 Paramount Bldg., Paramount, Calif., LB, **$1,009,033**, earthwork, concrete lateral lining, structures for Unit 1, Mohawk distr. sys., Gila Proj., DC 3618, ARIZONA. Bureau Reclamation, Dpt. Interior, Yuma, Ariz. Bids Jan. 24. CD 12/20.

† **Foster & McHarg**, 3610 8th St., Riverside, Calif., CA **$104,924**, est. $111,689, surface soil stabilization of an area within Nevada Test Site, near LAS VEGAS, NEV. U. S. Atomic Energy Comn., P.O. Box 5400, Albuquerque, N. M.

† **Marshall, Haas & Royce**, Belmont, Calif., LB, **$505,873** est. $510,307, earthwork, structures for Potholes East Canal, Station 2489 plus 41.75 to 3536 plus 23.07 bk and Pasco wasteway, Station 0 plus 00 to 15 plus 96, Columbia Basin Proj., Spec. DC 3619, WASHINGTON. Bureau Reclamation Dpt. Interior, Ephrata, Wash. Bids Jan. 29. CD 12/26.

L. E. Hoback, Everett, Wash., CA, **$62,400**, heavy riprap seawall at Salt-water State Park, REDONDO, WASH. State Parks & Recreation Commission, Legislative Bldg., Olympia, Wash.

† **U. S. Eng.**, 4735 E. Marginal Way, Seattle, 4, Wash., cancelled bids to have been opened Feb. 28, bulk aircraft fuel storage tanks, Eng 45-108-52-149; and bulk aircraft fuel storage, Eng 45-108-52-150 at McChord Air Force Base, TACOMA, WASH. CD 1/30.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

Peter Kiewit Sons' Co., 442 Post St., San Francisco, Calif., CA, **$2,515,564**, grading, surf. six grade separation structures 5 mi. between Railroad Ave. in Pittsburg and A St. in Antioch, Contra Costa Co. Bid Jan. 23, awarded Jan. 30. CD 1/30, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Bangiovanni Constr. Co., 2457 Canyon Dr., Los Angeles, Calif., LB, **$2,274,515**, 3 bridges, 1.4 mi. grading, etc. on Hollywood Freeway between Mulholland Dr. and Chauenga Blvd., Los Angeles, Los Angeles Co. Bids Jan. 31. CD 1/9.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Griffith Co., 1060 S. Broadway, Los Angeles, Calif., CA, **$2,307,503**, constr. etc. 1.7 mi. road on Ramona

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THE ATLANTIC PNEUMATIC ROCK BREAKER
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No Plugs and Feathers — No Explosives
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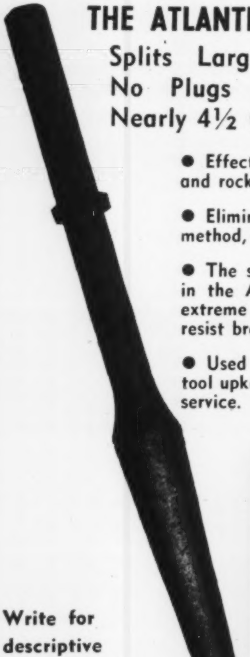

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Freeway between Jackson Ave. and Rosemead Blvd., Los Angeles Co. Bids 1/17. CD 1/28, under LB.

† **General Electric Co.**, 650 17 St., Denver, Colo., CA, **$577,044,** Schedule 1, three 66,000 kva transformers with spare parts for Folsom Power Plant, Central Valley Proj. Spec. DS-3565, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo. Bids Dec. 30, awarded Jan. 18. CD 1/4, under LB.

Healy-Tibbitts Constr. Co., 411 Brannan St., San Francisco, Calif., LB, **$812,720,** cellular steel sheet pile bulkhead, rock dikes, Berth 121, Pier E, HD 341, LONG BEACH, CALIF. Bd. Harbor Comn., Admin. Bldg., 1333 El Embarcadero, Long Beach, Calif. Bids Jan. 30.

† **Pittsburgh-Des Moines Steel Co.**, Santa Clara and Alvison Rds., Santa Clara, Calif., LB, **$523,880** nozzle and test section high speed wind tunnel Inv. A-7397 MOFFETT FIELD, CALIF. National Advisory Com. for Aeronautics, Ames Lab., Moffett Field, Calif. Bids Jan. 31. CD 1/4.

† **Four Companies**, 918 Harrison St., San Francisco, Calif., LB, **$538,768,** base warehouse and AIO compound warehouse at Parks Air Force Base, ENG. 04-203-52-23, PLEASANTON, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids Jan. 31. CD 1/18.

† **Stolte, Inc.**, 8451 San Leandro St., Oakland, Calif., CA, **$562,842,** Schedule B, addnl. facilities for Sacramento Beam Station, Mather Air Force Base, Spec. 1581, SACRAMENTO, CALIF. U. S. Eng., Wright Bldg., Sacramento, Calif. Bids Jan. 4, awarded Jan. 29. CD 1/11, under LB.

Schallock & Glanville Plumbing Co., 2618 Niles St., Bakersfield, Calif., CA, **$108,800,** sewerage sys., incl. diverting existing effluent constr. approx. 10-in. sewer line, etc., SPRINGVILLE, CALIF. Tulare-King Counties, Joint Tuberculosis Hospital Central Comm., office of Tulare Purch. Adj., Court House, Visalia, Calif. Bids Jan. 23, awarded Jan. 28. CD 1/11.

▲ **Walsh Constr. Co.**, 785 Market St., San Francisco Calif., CA **$1,419,000,** constr. 15 m. g. water filtration plant at Fleming Hill, VALLEJO, CALIF. City, City Hall, Vallejo, Calif. Bids Jan. 14, awarded Jan. 29. CD 1/23, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

School Dist. 301, Pe Ell, Wash., rejected bids Jan. 11, frame SCHOOL, PE ELL, WASH. **$478,000.** CD 1/3.

J. H. Hedrick & Co., 431 S. San Gabriel Blvd., San Gabriel, Calif., CA, **$357,767,** 60-unit low-rent HOUSING Project CA 19-7, BARTOW, CALIF. Housing Auth. of San Bernardino Co., 440 Crestview St., San Bernardino, Calif. Bids Jan. 23. CD 1/4.

T. A. Stanfield, Box 120, San Bernardino, Calif., CA, **$793,664,** 150 HOUSING units, Cal. 34-1, BRAWLEY, CALIF. Brawley Housing Auth., 624 E St., Brawley, Calif. Bids Jan. 23, awarded Jan. 21. CD 1/10.

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WITH OR WITHOUT FILL

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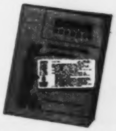

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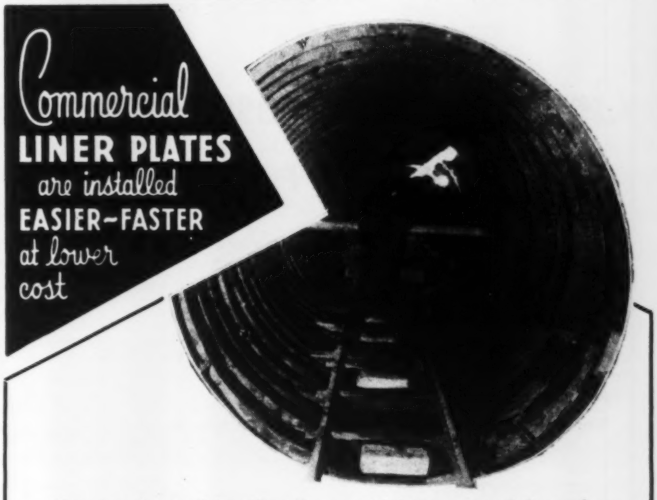

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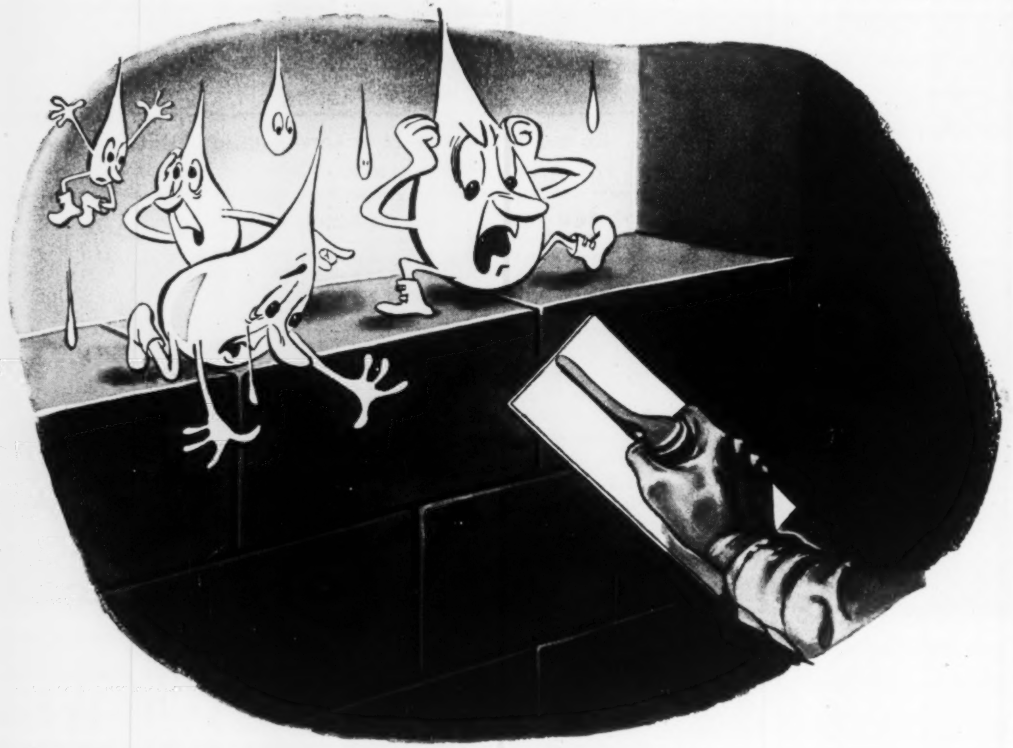

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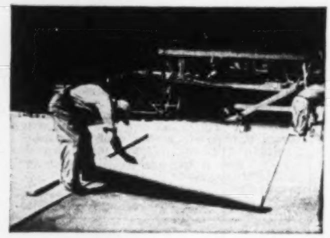
at low cost



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New York 17, N. Y. • San Francisco 5, Calif.

Samuel Barth, 1801 McDaniel Ave., San Jose, Calif., LB, **$314,282,** Quito Elementary SCHOOL, McCoy and Quito Rd., CAMPBELL, CALIF. Campbell Union Elementary School Dist., William C. Henley, supt., 121 S. Winchester Rd., Campbell, Calif. Bids Jan. 24. CD 12/31.

Trewhitt, Shields & Fisher, 926 Parallel St., Fresno, Calif., LB, **$405,800,** Lincoln Elementary SCHOOL, HANFORD, CALIF. Hanford City School Dist., Wesley F. Hull, supt., 208 Cameron St., Hanford, Calif. Bids Jan. 15.

Claude T. Lindsay Co., 824 Taraval St., San Francisco, Calif., CA, **$883,985,** 96-unit HOUSING, Proj. 136-80005 Army 1 and 136-80006, Army 2, LATHROP, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids Dec. 4, awarded Jan. 28. CD 12/11, under LB.

William Horstmeyer, 23 Marrs St., San Francisco, Calif., LB. **$348,600,** SAP 13, College Park SCHOOL addns., SAN MATEO, CALIF. San Mateo Elementary School Dist., 120 N. Ellsworth St., San Mateo, Calif. Bids Jan. 24. CD 1/3.

Peter J. Pasetta, 2795 Park Ave., Santa Clara, Calif. Own Forces, **$408,000,** RESIDENCES, Madeline Dr., Los Padres Blvd., Block Arlene and Dianne Dr., SUNNYBRAE, CALIF.

Joseph Bettancourt, 1015 San Mateo Ave., San Bruno, Calif. LB, **$419,526,** Spring Road Elementary SCHOOL, Hy. 40 N. of Spring Rd., VALLEJO, CALIF. Vallejo City Unified School Dist., 640 Carolina St., Vallejo, Calif. Bids Jan. 21. CD 1/7.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska**—TRANSFORMERS, etc.—B.A. 3/12—Bureau Reclamation, Dpt. Interior, Bldg., 53, Denver Federal Center, Denver, Colo., outdoor power transformers, outdoor power circuit breakers, outdoor disconnecting switches, for Anchorage sub-station, Eklutna Proj., Inv. No. DS 3653.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., Stoney Creek—B.A. 2/18—Village, A. E. Bland, clerk, Stoney Creek, sewage treatment plant, $75,000. Plans deposit $25. Gore & Storrie, 1130 Bay St., Toronto, engrs.

Man., Virden—B.A. 2/20—Underwood & McLellan, engrs., 502 Grain Bldg., Saskatoon, Sask., water distr. sys., sewer collecting sys., 2 sewage pumping stations, for Municipality, Virden, Man. CD 4/27/44.

BIDS ASKED—BUILDINGS

Que., Quebec City—CHURCH—B.A. 2/19—A. Dufresne, archt., 505 Royale St., Beauport, church, 4 Ave., for Parish of St. Fidele, 687 12 St. Approx. $350,000. CD 11/1.

Ont., Welland—SCHOOL—B.A. 2/25—A. B. Scott, archt., 65 Empire St., school, for B. Educ., 7 Main St. W. Plans deposit $15.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Oxford County Council, Woodstock, Ont., Own Forces, **$369,000,** paving and work on county roads and bridges, WOODSTOCK, ONT. Awarded Jan. 26.

Mofax Electric Ltd., 945 St. Andrew St., Montreal, Que., CA, **$400,000,** electrical services at Naval Stores, VILLE LASALLE, QUE. Govt. of Canada, Dpt. National Defence NAVY, Cartier Sq., Ottawa, Ont. M. P. McAndrew, 1247 Guy St., Montreal, Que., engr.

BUILDINGS

LOW BIDS AND CONTRACTS

Smith Bros. & Wilson Ltd., 1267 Richards St., Vancouver, B. C., CA, **$391,628,** central heating plant, COMOX, B. C. Defence Construction (1951) Ltd., 360 Homer St., Vancouver B. C. Bids Dec. 18, awarded Jan. 23. CD 11/29.

A. W. Robertson Ltd., 57 Bloor St. W., Toronto, Ont., CA, **$556,350,** Standard CENTRAL HEATING PLANT at military base, CAMP BORDEN, ONT. Defence Construction (1951) Ltd., 441 Queen's Quay W., Toronto, Ont. Bids Dec. 11, awarded 2/2. CD 12/6.

Johnson Bros. Co. Ltd., 37 Market St., Brantford, Ont., CA, **$395,000,** 1 story, 150x180 ft., steel, concrete Junior SCHOOL for the Blind, BRANTFORD, ONT. Dpt P. Wks., Parliament Bldgs., Toronto, Ont. Bids Sept 17. CD 9/10.

Schultz Constr. Ltd., 34 McMurray St., Brantford, Ont CA, Approx. **$325,000,** HIGH SCHOOL addn., alterations, PARIS, ONT. Paris District High School Bd., Roy Anguish, chn., 25 Broadway East, Paris, Ont. Bids Jan. 14. CD 12/28.

Commercial Leaseholds Ltd., 130 Ferguson Ave. N., Hamilton, Ont., CA, Approx. **$500,000,** 1 story, 60,000 sq. ft. rein.-con., brick, steel FACTORY and OFFICES, TORONTO, ONT. Harold F. Ritchie & Co., Ltd., 10 McCaul St., Toronto, Ont. Awarded 2/1.

▲ **Dinsmore Constr. Ltd.,** McDougal St. and CPR Windsor, Ont., CA, Approx. **$1,000,000,** 30x275 ft., STEAM PLANT addn., 100 ft. high, reinforced brick, WINDSOR, ONT. Hydro Electric Power Comn. of Ontario, 260 University Ave., Toronto, Ont. H. G. Acres & Co., 1235 Culp St., Niagara Falls, Ont., engrs. Awarded Feb. 2.

Montclair Constr. Co., Ltd., 5515 Western Ave., Montreal, Que., CA, **$347,254,** 1 story, 100x225 ft., 2 story 60x85 ft., municipal GARAGE for Western District on Upper Lachine Rd., MONTREAL, QUE. Municipality Montreal, Que. Bids Jan. 19. CD 12/27.

(Proposal Advertisements see pp. 258 and 259)

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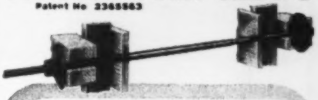

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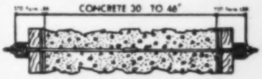

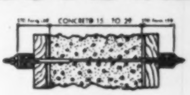

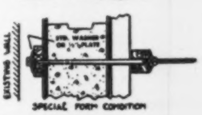

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Bids: February 27, 1952

New York State Highway Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, February 27, 1952, by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1 G. L. Nickerson, District Engr., 353 Broadway, Albany, N. Y.				
Albany	C.T. 52-1	New York State Thruway-Catskill Section Subdivision 1-5	11.68	Grading & Drainage	$120,000 Plans $50	$2,100,000
		DISTRICT No. 2 L. Ketchum, District Engr., 109 No. Genesee St., Utica, N. Y.				
5 Counties 2 Cities	FARC 52-12	Installation of Automatic Recording Traffic Counters in Dist. 2 Proj. SWHP-1(8)	....	Installation of 11 Automatic Record. Traffic Counters	$1,300 Plans $10	$22,440
		DISTRICT No. 3 William Robinson, District Engr., Weigh Lock Bldg., Syracuse 1, N. Y.				
4 Counties 2 Cities	FARC 52-13	Installation of Automatic Recording Traffic Counters in Dist. 3 Proj. SWHP-1(8)	....	Installation of 9 Automatic Record. Traffic Counters	1,100 Plans $10	19,080
Cayuga	FARC 52-7	Montezuma-Cayuga-Union Springs Pt. 1 S. H. 8518 Proj. F-1059(1)	2.71	9″ Cem. Conc. Pavt. 24′-36′ Wide	16,000 Plans $10	318,000
		DISTRICT No. 4 A. R. Mulligan, District Engr., Barge Canal Terminal, Rochester 1, N. Y.				
Livingston	FARC 52-17	Dansville-Conesus Pts. 1, 2 & 3 S. H. 1574-1702 Proj. F-579(3)	2.65	Asp. Conc. Ty. 1A, Opt.	27,000 Plans $10	493,000
Genesee & Monroe	OT 52-3 RC 52-22 ST 52-3	New York State Thruway-Ontario Section Subdivisions 6A, 6B & 7A Riga-Mumford S. H. 1284 Scottsville-Chili, S. H. 5279 Beulah Rd.; Winslow Rd.; Wheatland Center Rd.; Palmer Rd.; Baker Rd.; Cedars Ave.; Union St.; Sheffer Rd.	9.26	9″ Cem. Conc. Pavt. 2 @ 25′ Wide = 7.93 Mi. Asp. Conc. Ty. 1A, Opt. = 0.49 Mi. Misc. Work = 0.84 Mi. Conc. Box Culv. Br. 20′ 9 1/2″ Span.	188,000 Plans $50	3,421,000
		DISTRICT No. 6 H. F. Brumm, District Engr., State Office Bldg., Hornell, N. Y.				
Schuyler	FASS 52-3	Hammonds Corners-Tyrone C. R. 828 Proj. S-300(2)	1.82	D. S. T. Broken Stone	8,500 Plans $10	161,000
		DISTRICT No. 8 J. S. Bixby, District Engr., Pleasant Valley Road, Poughkeepsie, New York				
Dutchess	FARC 52-15	Wicopee-Beekman S. H. 627 Putnam County Line-Stormville Pt. 2, S. H. 9226 Proj. F-468(10)	1.51	9″ Cem. Conc. Pavt. 24′ Wide	19,000 Plans $10	327,000
Ulster	R.C. 52-19	Ashokan Boulevard (North Side) S. H. 47-5 Kingston-West Hurley, S. H. 5173	9.59	Landscaping	$900 Plans $15	$16,000
		DISTRICT No. 9 F. W. Donovan, District Engr., 71 Frederick St., Binghamton 21F, N. Y.				
Broome	FASH 52-2	Johnson City: Route 17 Connection Proj. U-1092 (3)	0.82 (0.27 Access)	Grading & Drainage = 0.79 Mi. Misc. Work = 0.03 Mi. (Access Drives Asp. Conc. Ty. 1A Opt = 0.27 Mi.)	24,000 Plans $15	411,000
		DISTRICT No. 10 J. J. Darcy, District Engr., Montauk Highway at Little East Neck Rd., Babylon, Long Island, N. Y.				
Nassau & Suffolk	NSP 52-1 SSP 52-1	Northern State Parkway Southern State Parkway	48.55	Screen Planting	5,000 Plans $10	90,000

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: February 26, 1952

Delaware Memorial Bridge

CONTRACT NO. 22
PLANTING OPERATIONS

Sealed proposals for Planting Operations along the approaches to the Delaware Memorial Bridge, will be received by the Delaware State Highway Department at the office of the Director, Delaware Crossing Division, Administration Building, Delaware Memorial Bridge, Delaware, until 12 o'clock noon Eastern Standard Time, February 26, 1952 at which time and place said proposals will be publicly opened and read.

The work involves the following approximate principal quantities:—

Topsoil	1150 cu. yds.
Commercial Fertilizer	575 lbs.
Grass Seeding	1000 sq. yds.
Sod	9000 sq. ft.
Major Trees	530
Minor Trees	509
Shrubs	360
Vines	281

Performance of this Contract shall begin promptly after execution of the Contract and shall be completed on or before May 15, 1952.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check to the amount of at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within twenty (20) days from the date of opening proposals. The right is reserved to reject any or all bids.

One set of the Plans and two copies of the Specifications may be obtained from the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y., after February 8, 1952, upon payment of $10.00.

Any prospective bidder who has made such a deposit may secure extra blueprint copies of the Plans upon payment of 50 cents per drawing and an extra copy of the Specifications upon payment of $2.50 per copy.

Plans and Specifications need not be returned to the Engineers, and the above payments will not be refunded.

The Plans and Specifications and other contract documents may be examined at the office of the Engineer, Howard, Needles, Tammen & Bergendoff, or at the Engineers' project office located north of and adjacent to the west abutment of the Delaware Memorial Bridge in the state of Delaware.

State Highway Department
by: J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
February 4, 1952

Bids: March 11, 1952

City of Wilmington, Delaware

Contract No. 8

Sealed proposals for furnishing materials and labor to construct Storm Drains, Sewers, and Pumping Station, Contract No. 8 of the City of Wilmington's Sewage Treatment Program will be received from qualified bidders by the Board of Directors of the Street and Sewer Department, Room 251, City Hall, until 2:30 P.M., Eastern Standard Time, March 11, 1952, at which time and place they will be publicly opened and read aloud.

Each proposal shall be submitted in a sealed envelope which shall be marked to clearly indicate its contents. If the proposal is forwarded by mail, it shall be enclosed in an additional envelope addressed to the Board of Directors of the Street and Sewer Department, City of Wilmington, Delaware. If submitted other than by mail, it shall be delivered to Room 260, City Hall.

The work embraces the construction of approximately 5300 feet of 15 inch to 60 inch diameter reinforced concrete pipe storm drains, 450 feet of 11″ x 18″ and 13″ x 22″ corrugated metal pipe arch, 4200 feet of 6 inch to 18 inch vitrified clay pipe sanitary sewers and house connections, 410 feet of 12 inch and 16 inch cast-iron pipe sanitary sewers and force main, a reinforced concrete and brick pumping station and other miscellaneous and appurtenant work. A portion of the work will be supported on timber piles. The work is located in the 12th to 27th Street area of East Wilmington, certain portions being on the property of the P. B. & W. R. R. A rating has been obtained for this work from N.P.A.

Drawings and specifications may be obtained from the office of the Board of Directors of the Street and Sewer Department of the City of Wilmington, Room 260, City Hall, or from the office of Whitman, Requardt and Associates, 1304 St. Paul Street, Baltimore 2, Maryland, upon deposit of Twenty-five Dollars ($25.00) for each set of drawing and specifications, which deposit will be refunded upon return of the plans and specifications in good condition. The drawings which are furnished prospective bidders for a deposit are one-half (½) scale reproductions of the originals. If a bidder desires a set of drawings which are full scale reproductions of the originals, he may obtain them upon payment of Ten Dollars ($10.00) for each set desired which payment will not be refunded.

The Board of Directors of the Street and Sewer Department reserves the right to reject any or all bids and to accept the bid which in its opinion best serves the interests of the City.

By order of
Board of Directors of the Street and Sewer Department
Vaughan Clavey—President
Attested
James J. Livingstone, Secretary

OFFICIAL PROPOSALS

Bids: March 13, 1952

Glencoe Water Works

GLENCOE, ILLINOIS

Sealed bids will be received at the office of the Village Clerk in the Village Hall, Glencoe, Illinois until 8:00 o'clock P.M., March 13, 1952 and at that time publicly opened and read in the Board Room at the Village Hall, on the following water works improvement contracts:

A—Structures and Piping
B—Mixing Equipment
C—Filter Equipment
D—Pumping Equipment

Plans and specifications are on file and may be examined at the office of the Village Clerk and of Mr. George R. Young, Village Engineer, Village Hall, Glencoe, Illinois, and at the office of Alvord, Burdick & Howson, Engineers, 20 N. Wacker Drive, Chicago 6, Illinois.

Plans and specifications may be obtained by depositing cash or a certified check payable to the Village of Glencoe or to Alvord, Burdick & Howson in the amount of $25.00 for Contract A, $10.00 for Contract B, $20.00 for Contract C, and $5.00 for Contract D, for each set of documents so obtained. The Amount of the deposit for one set of documents will be refunded to each actual bidder who returns the plans and documents in good condition within ten days after the opening of bids. Additional copies of the contract documents may be bought for the same price, with no refund.

Each bid must be accompanied by a certified check or bidder's bond in a surety company authorized to do business in the State of Illinois for ten (10%) per cent of the bid, payable to the order of the Village of Glencoe, Illinois, which sum shall be forfeited in case the bidder fails to enter into contract within ten (10) days after the contract has been awarded to him.

The successful bidder will be required to furnish a surety bond satisfactory to the Village in a surety company authorized to do business in the State of Illinois, covering the full amount of his contract.

No bid may be withdrawn after the time for opening bids is passed.

The Village reserves the right to reject any or all bids or waive any informality in any bid, and to accept any considered advantage to the Village.

Bidders are notified that the successful bidder will be required to pay not less than the prevailing rate of wages for workmen engaged in the work, in accordance with the provisions of An Act of The General Assembly of the State of Illinois entitled 'An Act Regulating Wages of Laborers, Mechanics and Other Workmen Employed Under Contracts For Public Works', approved June 26, 1941.

(SIGNED) H. B. BRAY
Village Clerk
Glencoe, Illinois

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3656) will be received at Bismarck, North Dakota, until March 18, 1952, for furnishing labor and materials for: Jamestown Dam, Missouri River Basin Project. Location: One mile north of Jamestown, North Dakota. Principal items are: 366,000 cu.yds. of excavation for dam foundation and structures; 770,000 cu.yds. of borrow excavation for dam embankment; 6,975 cu.yds. of concrete in structures; installing high pressure gates and other metalwork; and other work. Completion time 800 days. For particulars, address Bureau of Reclamation, Bismarck, North Dakota; or Building 53, Denver Federal Center, Denver, Colorado.

Department of Commerce, Bureau of Public Roads, January 30, 1952. SEALED BIDS will be received at the office of the Bureau of Public Roads, Gatlinburg, Tennessee, until 1:30 p.m., E.S.T., FEBRUARY 29, 1952, for Project 3C1, Great Smoky Mountains National Park, Blount County, Tennessee. From Tremont Intersection to Park Boundary. Length 0.845. mile. The approximate quantities of the more important items are 20,500 cu. yd. Excavation, 6,500 Tons Crushed Gravel or Crushed Stone, and 350 cu. yd. Cement Boulder Embankment. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the office of the Division Engineer, 1440 Columbia Pike, Arlington, Virginia, or at the address given above. H. J. Spelman, Division Engineer.

(Continued on page 274)

SEARCHLIGHT SECTION

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CHIEF ESTIMATOR for general contractor in middle west bidding heavy construction work. Must be qualified to take complete charge of estimating. State experience, references, availability and salary requirements. P-3284, Engineering News-Record.

CIVIL ENGINEER with sales experience has good opportunity in Pittsburgh territory with large manufacturer in construction field. Must have C.E. degree. Should have experience contacting engineers and contractors. State qualifications in first letter. P-3223, Engineering News-Record.

DESIGN ENGINEER and Design Draftsman, each having a minimum of five years experience in the sanitary engineering field. Salary commensurate with experience and ability. Long established consulting engineering firm located in Maryland. Our employees know of this advertisement. P-3121, Engineering News-Record.

ENGINEER for City of New Britain, Connecticut Water Department, Topographical surveys. Property and pipe maps. Hydraulic computations. $3328-3952 per annum. Civil Service Commission, City Hall, New Britain, Connecticut.

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(Continued on page 261)

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P-3280, Engineering News-Record
1111 Wilshire Blvd., Los Angeles 17, Calif

(PLEASE REFER THIS AD TO SOMEONE YOU THINK MIGHT BE INTERESTED)

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ENGINEERS

... after training at
full-time pay ... as

Consultants in
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to top U. S. and Canadian industry. Usual pension and other benefits. Excellent opportunities; fast-growing engineering organization.

Write complete qualifications to:
P-2807, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

CONTACT MAN with connections for well established **CONSULTING ENGINEERING FIRM.** Twenty-four men: qualified, registered Engineers and Architects specializing in Structural Steel Design, Concrete Design, Plant Layout and Conveyor Design, Structural Steel Detailing, Piping, and Architectural work of any nature. Liberal commission plan.

P-3205, Engineering News Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

Civil Engineers and Topographic Draftsmen for investigation and planning of flood and low flow control and related projects. Experience in hydraulics and hydrology desirable for engineers, but not necessary. Permanent positions, opportunity for advancement. Address inquiries to

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201 West Monroe Street, Springfield, Illinois

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Our Liberal *Profit-Sharing Bonus* in 1951 amounted to more than a half million dollars.

We need the following type of men experienced in any phase of Blast Furnace, Steel Mill and Oil Refinery Design:

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Positions available in our offices at Cleveland, Ohio, Union, New Jersey and Tulsa, Oklahoma.

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ARTHUR G. McKEE & CO.
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DESIGN ENGINEER
FOR
HYDRAULIC MACHINERY

FOR HIGH DAM IN INDIA

The Government of Punjab (India) desires to engage on contract for two years in the first instance the services of a design engineer for hydraulic machinery i.e. gates, outlets, valves, etc., for a 680 feet high straight gravity dam. The applicant must possess a college degree and have about ten years experience in design of such feaatures with a reputable firm of designers or a Government organization. Furnished quarters fitted with electricity and water supply available in the Project Township having other Americans with families. Apply by mail in duplicate to M. R. CHOPRA, *Technical Counselor, Embassy of India, Washington, D. C.*, giving full details of qualifications and experience, stating minimum net salary acceptable after deduction of Indian income tax.

WANTED
ENGINEER

To head dam division on our consulting engineering staff.

P-3272, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERS

for design and construction of several major municipal projects. Starting Salaries: $3707, $4515, $5334, $6143, $7036 per year. Write

DETROIT CIVIL SERVICE COMMISSION
735 Randolph St. Detroit 26, Mich.

POSITIONS VACANT
(Continued from page 259)

OFFICE MANAGER—Accountant. Permanent position with Mid Hudson Valley construction contractor. Must be capable of taking full charge of all phases of office management. Experience in construction preferred. New apartment immediately available. Submit resume. P-3222, Engineering News-Record.

PRODUCT DEVELOPMENT Engineer Wanted —Must have good technical education background, preferably in Engineering or Architecture, with practical experience in insulations, coatings and adhesives. Must be willing to travel. Liaison activities between Research and Sales in a progressive and well-known insulation manufacturing. P-3249, Engineering News-Record.

SEWER SUPERINTENDENT, Middle West. Capable of taking complete charge of large scale municipal sewer installations. Practical experience necessary, engineering background helpful. Give full qualifications, age, references, salary expected in first letter. Permanent employment to man who can proudce. P-3241, Engineering News-Record.

SUPERINTENDENT: Must be experienced in estimating, negotiating field and especially supervise "Guniting", Pressure Grouting, Concrete and Masonry Restoration. Also New Construction for Railroads, Utilities and Industrial Plants. State age and experience. Salary open. P-2978, Engineering News-Record.

TUNNEL SUPERINTENDENT, Middle West. Capable of taking full charge of tunnel operations in connection with large scale municipal sewers. Give full qualifications, age, references, salary expected in first letter. Permanent employment to man who can produce. P-3244, Engineering News-Record.

WANTED: ASPHALT Construction Supt. Must have several years experience, be young, aggressive, preferably with engineering background. Real opportunity for permanent position for right man. Chicagoland area. Give resume of experience and salary requirements. P-3301, Engineering News-Record.

WANTED IMMEDIATELY Superintendent thoroughly experienced to supervise on large canal and levee project in Southeast. Must be good organizer, producer, know men and equipment. Write stating qualifications. P-2925, Engineering News-Record.

WANTED. TOP Notch Superintendent for roads, grading, utilities. Familiar with maintenance of equipment. New Jersey area. Salary commensurate with ability. P-3263, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

SALES ENGINEER for large concern in construction field. Must have degree in civil engineering. Prefer person having experience in contacting engineers, contractors, and promoting federal projects. Desire resident of Washington, D. C., vicinity, where position is located. SW-3139, Engineering News-Record.

EMPLOYMENT SERVICE

ENGINEERS NEEDED in all fields at all levels. Salaries commensurate with experience & ability. Highly confidential service. Bring or mail 3 resumes to: Position Securing Bureau Inc. (Agency), 45 John St., N. Y. 38, N. Y.

POSITIONS WANTED

CHIEF STRUCTURAL Engineer, graduate C.E. registered with National Bureau, over 25 years experience in design and construction of industrial buildings, bridges, hydro-electric developments, heavy engineering structures; field and office supervision. 10 years foreign service. Knows languages. Desires permanent connection with growing concern. PW-2944, Engineering News-Record.

CIVIL CONSTRUCTION, Irrigation & Drainage Engineer-Graduate Civil Engineer. Thirty five years diversified experience in technical administration, planning, design and supervision over construction works. Recently completed one year on overseas assignment. Interested in position with major construction company or consulting engineering firm. PW-3286, Engineering News-Record.

CIVIL ENGINEER: Contractor-Engineer representative or supervising engineer. Broad field and office experience, general construction, airports, highways, municipal and major defense projects. Reports. Twenty years on responsible assignments in Latin America, West Indies, Pacific Islands and Far East. Fluent Spanish. Willing to travel. Prefer South or foreign but any location considered. Reliable, active and in excellent health. Age 64. Personal interview suggested. Registered P.E. N.Y. Now in New York City. PW-3294, Engineering News-Record.

A COURSE OF INSTRUCTION BY MAIL IN

STRUCTURAL ENGINEERING

Forty-second Year

OUR COURSES HAVE HELPED THOUSANDS
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- Complete Structural Engineering Course.
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Monthly payments permissible. Information sent without obligation. WRITE TODAY

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POSITIONS WANTED

CIVIL ENGINEER—graduate, young, 3 yrs. experience heavy construction, desires permanent position in N.Y., N.J. metropolitan area with responsibility and future in the engineering profession. PW-3296, Engineering News-Record.

CIVIL ENGINEER, graduate, 18 years broad experience in hydraulics, irrigation, power, flood control, conservation. Qualified reinforced concrete designer. Capable supervisor and administrator. Desire responsible position in Western U. S. with opportunity for accomplishment. PW-3256, Engineering News-Record.

CIVIL ENGINEER Graduate, twenty-eight, single, registered, four and one-half years experience with Consulting Engineer firms, firm background of field work, also office work, Expressway planning, construction supervision and layout; one year experience in Sea Bees. Presently employed, but desires job with more challenge and future. PW-3044, Engineering News-Record.

CIVIL ENGINEER, licensed, early thirties, 10 years experience heavy industrial construction, field and office supervision. PW-3189, Engineering News-Record.

CIVIL ENGINEER with Legal Degree: Jun. M ASCE: 26; Married; Veteran B.S. Jan.'49; LLB June'52; 1 year experience in Bridge Design; 4 months with Highway Planning Dept. PW-3311, Engineering News-Record.

CIVIL-STRUCTURAL Engineer. Age 26, married, registered, 5½ years varied experience. Design, teaching, inspection, specs., supervision. Desires position with consulting engineer or contractor. PW-3190, Engineering News-Record.

CONSTRUCTION MAN, long and thorough experience at supervision, estimating, purchasing, costs and all details, both heavy and building construction, available for new connection requiring high grade man able to assume full responsibility. C. O. Sutherland, RFD 1, North Plank Rd., Newburgh, N. Y. Tel. 6959.

CONSTRUCTION SUPERINTENDENT, background of engineering, masonry, and carpentry with following. Cleveland area. PW-3279, Engineering News-Record.

ENGINEER-GRADUATE Civil, age 34, 11 years experience; 5 in steel fabrication, 3 in construction, 2 in production, 1 in civil. License civil in Ky. Desire permanent position with young aggressive firm with possibilities of advancement. Southern Ohio and Ind. or Ky. preferred. PW-3251, Engineering News-Record.

GENERAL CONSTRUCTION Superintendent, experienced in concrete bridges, highways, airports, asphalt paving, and all types of sewer and water main Installations, Industrial buildings, Mechanical Installations, Marine Pile driving, 20 years Experience, Sober, will travel and relocate, age 50, not a college graduate. PW-3269, Engineering News-Record.

GENERAL SUPERINTENDENT 48—25 years experience—heavy construction, highways, airports, bridges, powerhouse, cofferdams, tunnels, sewage systems, heavy industrials, have following of experienced men. Now employed but available for long term employment. PW-3023, Engineering News-Record.

SUPERINTENDENT 25 years construction experience, bridges, dams, disposal plants, pumping stations, concrete structures, sewer and water systems, heavy excavation rock and soil, waterfront work, etc. Good organizer, know men and equipment, familiar with labor and material costs and distribution. Available immediately, any location. PW-2991, Engineering News-Record.

NOTICE OF SALE—S-142

Sealed bids will be received by the City Purchasing Officer, Room 104, City Hall, Saginaw, Michigan, until 3:00 P.M. Tuesday, April 15, 1952, and then publicly opened in the City Hall for the sale of the following:

FOR DEPARTMENT OF PUBLIC WORKS—

2—Used, 20-inch vertical non-clogging centrifugal sewage pumps with cast iron enclosed impellers, designed to operate at a 25-foot head, complete with 3 phase, 60 cycle, 440 volt, 150 h.p. electric motors, and electric starting equipment. Detailed specifications will be furnished upon request.

FOR THE FIRE DEPARTMENT—

2—Induction motors, Model 62A886, type KT 926, 220 volts, 5.37 amps, 2 h.p. cont. 3 phase 1740 RPM General Electric

2—Direct current generators, Model 42A815, type BD 33, shunt wound, 9 amp, volts 125—1⅛ KW, 1800 RPM General Electric

Forms for making bid and conditions of sale may be obtained from the Purchasing Officer.

The City reserves the right to accept any bid or any part thereof, or to reject any and all bids or part thereof.

C. A. MILLER
City Manager

R. A. BENWAY
Purchasing Officer

CORPS OF ENGINEERS, Office of the District Engineer, Detroit District, 1900 Cadillac Tower, Detroit 26, Mich., 11 February 1952. Sealed proposals will be received at this office until 2 o'clock p.m. on the 14th day of March 1952, and then publicly opened for the sale of 5 units of used hydro-electric generating equipment, complete, including turbines, generators, miscellaneous switchgear, etc., presently located at Sault Ste. Marie, Michigan. Copies of sale advertisement No. CIVENG-20-064-52-36 (Sales) may be obtained by application to this office and units may be inspected by application to Area Engineer, Soo Area, Corps of Engineers, Sault Ste. Marie, Michigan.

POSITIONS WANTED

TRACK AND Special track-work Specialist, Railroad, subway, elevated, street railway and special track-work experience. Tee rail and Girder rail work. Broad engineering and construction experience, especially in the transportation field. Thirty-five years experience in private industry and government activities in design, construction and economic fields. Availability is dependent upon the location and incentives offered; whether on a full-time or part-time basis. PW-3034, Engineering News-Record.

GENERAL FOREMAN, 20 years experience, all phases of highway construction. Can organize and manage any size job. Available at once. PW-3167, Engineering News-Record.

SELLING OPPORTUNITY WANTED

HIGHWAY CONSTRUCTION Equipment—Sales & Service—thirty years experience—Will go to Rio de Janeiro with good connections—Excellent references given upon request both in Brazil and U.S.A. RA-3318, Engineering News-Record.

WORK WANTED

CIVIL ENGINEER, P.E.—20 yrs. experience. Available N.Y.C. evenings, Saturdays—Planning, Design, Drafting, Estimating. Call OL 4-8780 or write WW-3283, Engineering News-Record.

BOOKS FOR SALE

Structural Engineering Course, by Wilson Corp. ½ price, 2 years of supervision left. Write for details. BFS-3297, Engineering News-Record.

PATENT ATTORNEY

CONSULT: Z. H. POLACHEK
Reg Patent Attorney, 1234 Broadway, New York 1, N. Y.

DIESEL POWER

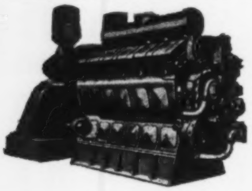
FOR

IMMEDIATE SHIPMENT

UNIT CAPACITIES—10 TO 1875 KVA

A.C.—50 AND 60 CYCLES

VARIOUS VOLTAGE



A PARTIAL LISTING OF OUR INVENTORY

KVA	Make	Model	HP	RPM	KVA	Make	Model	HP	RPM
1875	Fairbanks Morse	33F16	2000	300	375	Enterprise	DSG-6	450	450
1420	Fairbanks Morse	38D8⅛	1600	720	330	Superior	KNA	396	514
1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12½x13T	750	600	125	General Motors	3-268A	150	1200
425	Baldwin	VO-6	510	450	75	General Motors	6043C	90	1200
400	Buckeye	80	480	600	62.5	Int'l Harvester	UD-18	76	1200

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For Immediate Delivery

100 Tons 8" x 36# Bearing Piles
100 Tons 10" x 42# Bearing Piles
100 Tons 12" x 53# Bearing Piles
100 Tons 8" x 31# H-Beams
100 Tons 10" x 49# H-Beams
100 Tons 12" x 65# H-Beams

We can book above sizes in all other weights for shipment from mill.

We can also furnish from stock I-Beams, Channels, Angles, and Plates.

Contact us for all Structural Steel items.

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47-29 VAN DAM STREET
LONG ISLAND CITY 1, N. Y.

STILLWELL 4-2720 DIRECT WIRE VIA
STILLWELL 6-5448 WESTERN UNION

Portable Compressors

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Sales—Rental
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15 CFM LINDSAY (Gas) 2 Pneu
25 CFM LINDSAY (Gas) 2 Pneu
30 CFM WORTH. (Gas) 2 Pneu
30 CFM LINDSAY (Gas) 2 Pneu
60 CFM WORTH. (Gas) 2 Pneu
105 CFM WORTH. (Gas) 2 Pneu
105 CFM WORTH. (Gas) 4 Pneu
160 CFM WORTH. (Gas) 2 Pneu
160 CFM WORTH. (Gas) 4 Pneu
210 CFM WORTH. (Gas) 4 Pneu
315 CFM WORTH. (Gas) 4 Pneu
315 CFM WORTH. (Diesel) 4 Pneu
500 CFM WORTH. (Diesel) 4 Pneu
575 CFM WORTH. (Diesel) 4 Pneu

RENT—SELL—BUY

— LIKE NEW —

596 CFM—100 H.P. Motors—100# Schramm Model 420 Base Mounted — 3/60/220/440 — Built-in type with self contained cooling system—Three available —immediate shipment.

GET BETTER FOR LESS

American Air Compressor Corp.
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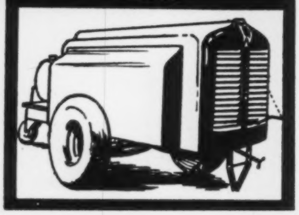

Crushers, Jaw: Sizes 12" x 15" to 48" x 60".

Crushers, Reduction: Symons, Telsmith, Allis Chalmers, various sizes.

Dryers or Kilns: 2—10 ft. x 90 ft. heavy duty with or without auxiliary equip., condition like NEW.

Diesel Motor: Cat. D13000 port. on skids, 122 H.P.

Cranes: Lima 802 steel erector's Crane or dragline, 120 ft. boom, 20 ft. jib, with powered boom, condition like new Northwest model 95, diesel, 80 ft. boom, 2½ yd. capacity, used nine months.

Shovel, Diesel: Lima 1201, Cummins motor, 3 yd. capacity, new 1951.

Compressors: Worthington DC2, 29- 18½ x 21, motor 600 H.P. synchronous, 440 volt, with all auxiliary equipment. 4— Ing. Rand Diesel port., 500 cu. ft. @ 100 lbs. pressure, new 1951.

Electric Motors: 2—NEW 1000 H.P., 1800 RPM, 2300 volt, drip proof with automatic switch gear. UNUSED. 1—950 H.P. Hoist Motor, 3 phase, 60 cycle, 443 RPM, 2200 volt, with all control equipment.

Mine Hoists: 150 H.P., 6'6" dia., 6'8" face, 200 H.P., 72" dia., 48" face, 250 H.P., 60" dia., 72" face, 200 H.P., double drums, 8 ft. dia., 4 ft. face, one clutched. All 3 phase, 60 cycle, 2200 volt, with control equipment. Head Frame for double shaft, 16'9" x 17'2", height 55 ft. with or without 8 ft. dia. sheaves for 1-½" rope.
Other Hoists 100 H.P. to 1050 H.P., single and double drum with electric equipment.

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FOR SALE

40 ton Orton Diesel Locomotive Crane
30 ton Ind. Brownhoist Gas Loco. Crane
Clyde 45 ton Elec. Gantry Crane new 1949
Manitowoc 2000 Crane 1½ yd. 80 ft. bm.
65 ton Whitcomb Diesel Elec. Locomotive
8¼ x 10 Clyde 3 Drum Steam Hoist
Rex 200 Single Pumpcrete. Gas powered
Northwest 80D 2½ yd. Diesel Combination
60 HP American 3 Drum Gas Hoist

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St. St. Louis 1, Mo.

LOCOMOTIVE

1—Plymouth 6 Ton Gas—36" Ga.—Like New.
1—Brookville 10T-30" Ga. Diesel—Like New.
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1—Brookville—15 Ton—Diesel—Stdy.—Ga.
1—Plymouth 35T. Gas. Std. Ga., Very Good.
1—Whitcomb 6 Ton—36" Ga.—Diesel.
1—Plymouth 20 Ton Gas—Std. Ga.
2—Plymouth 45 Ton Diesel—Elec—Std. Ga.

LOCOMOTIVE CRANES—STEAM

1—Ohio—30 Ton Coal Fired. Excellent.
Industrial—50 T. Type L.
Burro Mod. 20—5½ Ton—Gas.

MISCELLANEOUS

24 Hopper Cars—15 Ton—36" Ga.
1—American 3-Drum Gas Hoist—185 HP. Like New.
1—Lima 850 D & C—Hesseleman Eng.—70' Boom—
2—50 Ton Hopper Cars—Excellent.

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NEW and REBUILT
STORAGE BATTERY

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1½ to 10 Ton — 18" to 58" Track Gauge
GREENSBURG MACHINE CO.
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Pile Driving Equipment

Vulcan and McKiernan-Terry
Steam Pile Hammers and Extractors
Pile Driving Accessories
Drop Pile Hammers and Caps
Steel Sheet Piling

CONTRACTORS MACHINERY Co.
2637 Southwest Blvd. Kansas City 8, Mo.
Phone Valentine 4740

EQUIPMENT FOR SALE

4—Ingersoll-Rand FM 2 x 71 WD Wagon Drills
1—Caterpillar D-7 Bulldozer
2—60 K.W. Diesel Generators
1—Model C Scoopmobile with 1 Yd. Bucket
1—2 Cu. Yd. Lima Crane & Shovel
1—1½ Cu. Yd. Lima Crane & Shovel
1—¾ Cu. Yd. Lorain Truck Crane
1—500 c.f.m. Ingersoll-Rand Portable Compressor
1—Oliver, Model 80, Rubber Tired Tractor
1—Parsons, Model 250, Trenchliner
1—Austin, Model 155, Trencher
1—Carr, Model A, Formgrader
2—Single Drum, 40 HP, Clyde Electric Hoists
1—Double Drum, 8¼ x 10, American Steam Hoist w/o Boiler

SUBJECT TO PRIOR SALE

FRAZIER-DAVIS CONSTRUCTION COMPANY
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STerling 1950

SALE OR RENT

1—10 Ton Link Belt YC-9 Cargo Crane
1—10 Ton Browning 15-C Truck Crane
1—½ Yd. Unit 10-wheel Truck Crane
1—MC414 Lorain Truck Crane
1—TC70 Link Belt Truck Crane
2—D6 Caterpillar Tractors—Hydr. Blades
1—25 N.W. Crane 1948
1—#6 N.W. Shovel 1948
2—45 Ton Diesel Elec. Locos.
1—6 Ton Huber 3W Roller gasoline
2—10 Ton Stiff Leg Derricks
1—40 Ton Orton Diesel Loco. Crane
1—40 Ton Industrial-Brownhoist Oil Fired Loco. Crane New 1943

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Schramm 105 cubic foot gas powered compressor on 4 steel wheels.

Ingersoll-Rand 105 cubic foot, Waukesha gasoline power, on two rubber tires.

Gardner-Denver 160 cubic foot gas powered compressor on 4 steel wheels.

Worthington 210 cubic foot, two-stage, air-cooled, on steel wheels with Hercules diesel.

Gardner-Denver 365 cu. ft. Diesel Rebuilt.

Gardner-Denver 500 cu. ft. diesel, new condition.

Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven 50 HP slip ring motor.

Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.

Paving breakers, jackhammers, wagon drills, tie tampers.

QUARRY EQUIPMENT & BINS

4024 Cedarapids roll, rebuilt.

Symons 3' short head.

Cedarapids Rock-It with 2025 jaw, 3033 mill, new.

Cedarapids 1236 Model 6C plant, new.

3033 Cedarapids Hammermill, Rebuilt.

10x7 Allis-Chalmers Blake type jaw crusher.

#1 Cedarapids Kubit impact breaker.

4' x 6' Kennedy Van Saun single deck.

4' x 6' Kennedy Van Saun double deck.

3' x 8' Kennedy Van Saun triple deck.

3' x 10' Symons double deck.

18" x 90' bucket elevator.

80-ton, 2-compartment, 8'x18' storage bin with clamshell gates.

Conveyors—18"—24"—30"—36". Also belt.

TRUCKS—TRAILERS

1½-ton Ford with any body.

2½-ton GMC, rebuilt.

1949 White Model WC26 dump trucks, new condition.

2000-gallon tanks on semi-trailer mounting.

New and rebuilt dump bodies.

2,000 gallon tanks on semi-trailer mounting.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

GASOLINE AND DIESEL ENGINES

Buda, Hercules, Hill diesels, rebuilt.

New and rebuilt Murphy diesels, ME-4 & 46.

GM 6 and 12 cylinder diesels, practically new.

SHOVELS—CRANES

Lorain L-50, 1-yd. diesel. New condition.

L-41 diesel powered ¾-yd shovel, rebuilt.

Brownhoist 1-yd. gas shovel and crane.

SHOVEL & CRANE ATTACHMENTS

Lorain TL-20 shovel attachment.

Lorain 41 Chain Crowd Shovel Attachment. Complete.

Lorain 40 Hi-Lift shovel attachment.

P&H 203 shovel attachment.

Chain crowd Lorain 30A shovel attachment.

Bucyrus-Erie 1½-yd. rock bucket.

Lorain 80-820 fairleads.

Backhoe Buckets & Attachments

Lorain TL-25 hoe attachment, new.

Lorain 30 hoe attachment complete.

¾-yd Lorain, 40, LBS #6105. 44" cutting width.

28" outside width solid bottom type LBS #4377, good condition.

¾-yd Amsco 40" cutting width, LBS #8101.

CLAM—DRAG—SCRAPER BUCKETS

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.

McCaffrey Model 636 for ¾-yd to 1-yd crane.

SHOVEL DIPPERS

Lorain 41, ¾-yd. LBS #8600, rebuilt.

New Lima 1-yd, Amsco, LBS #2295.

Bucyrus-Erie 1¼-yd gas air, LBS #3782, fair.

Lorain 75B, 1½-yd. manganese bucket, LBS #8538.

Lorain 75B, 1¼-yd extended lip, 1¾-yd LBS #2260.

Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS #5361.

Pettibone-Mulliken 2-yd for 3500 Manitowac LBS #5763.

Esco 2½ yd cast weld dipper with bail & teeth

CONCRETE ROAD BUILDING & MISCELLANEOUS CONCRETE HANDLING EQUIPMENT

Concrete Finishers

Jaeger type "L" double screed, 10½'-12½', rebuilt.

Heltzel 10'-12' finisher, rebuilt.

Blaw-Knox gas-electric 10½'-12½', rebuilt.

2 Koehring 10'-12', rebuilt.

Concrete Road Forms

1220'—Heltzel 9"x8" forms with stakes.

1430'—Heltzel 10"x8" forms, with stakes.

Fine Grade Machines

R.B. Fine Grader for 21' width, rebuilt.

Form Graders—2 of each

Cleveland formgrader, new 1944, rebuilt.

Carr formgrader, new 1944, rebuilt.

WELL DRILLS & TOOLS

Keystone 70 well drill. Good.

Sanderson-Cyclone #42 well drill, new.

Sanderson-Cyclone #44 well drill, new.

Bits—Stems—Bailers—Sockets—Etc.

PUMPS

New Layne Bowler type 18 deep well pump with right angle gear drive. 3000 GPM at 120' TDH.

Used and rebuilt pumps, all sizes, gasoline, electric or diesel.

GRADERS

Austin Western 77 tandem drive, scarifier, 12' blade, gas power, hydraulic controls.

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The most complete and varied stock of used construction and material handling equipment on the Atlantic Seaboard

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PLUS Complete shop and field service facilities to keep you going
PLUS A sense of responsibility to our customers and a reputation for fair dealing

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Cranes—Crawler, Truck Cranes, Tractor mounted, wheel type, Industrial
Draglines & Drag Scrapers
Earth Augers
Engines—gasoline & diesel
Finishers—Floor
Fork Lift Trucks
Graders—Diesel Power
Generators—Portable
Grinders—Portable
Hammers—Pile & Extractors
Hoists—Gas, Diesel, Electric, Pneumatic
Hoisting Towers—Portable
Hoppers—Concrete
Light Plants—Portable
Loaders—Bucket & Front End
Mixers—Concrete, Mortar, Plaster
Pneumatic Tools—All Types
Pipe Layers—on crawler tractors
Power Units—gasoline, diesel
Pumps—Centrifugal, Diaphragm, Pneumatic, Plunger, Jetting
Pumpcrete outfits
Road Machinery
Rollers—3 wheel, tandem, sheepsfoot
Saw Rigs—Portable
Scrapers—Wagon, Tractor Drawn
Scrapers—Diesel Powered
Spreaders—Concrete, Stone
Shovels—Combinations
Surfaces, Concrete
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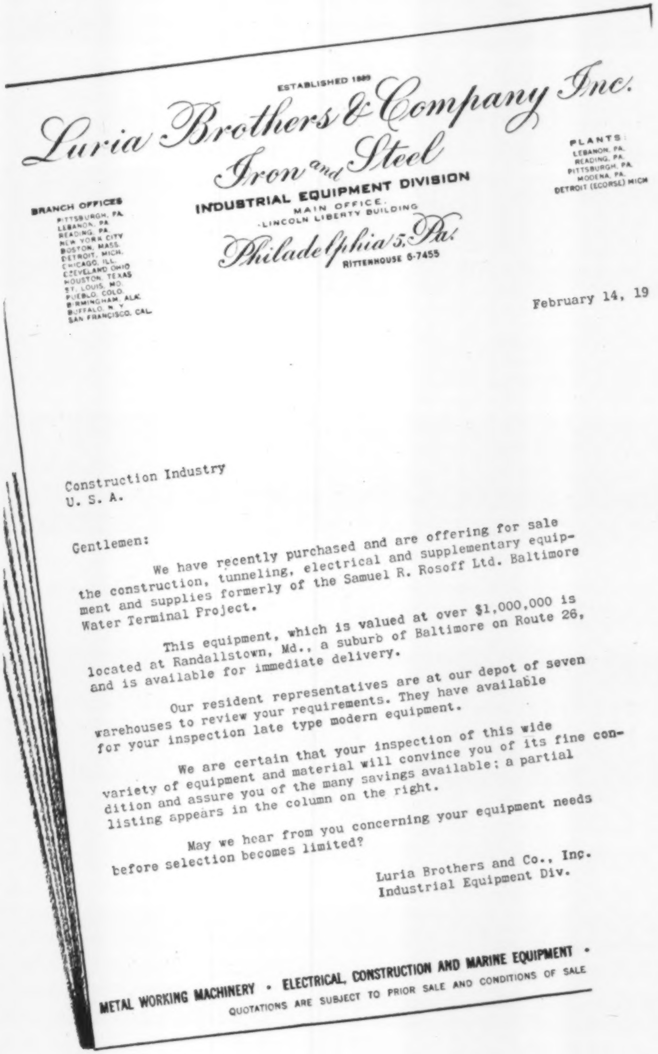

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2—Muckers, Eimco Rocker Shovel, Model 21 for 24 gauge track, equip. with Ingersoll-Rand Air Motors, model HH5D, Serial Nos. 3483 & 3904.

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1 Hoist, Mine—Lidgerwood with Caterpillar Diesel D13000 Power Unit—6 cylinder—5¾" Bore—128 H.P. Drum 54" x 30"—6¼" shaft 2¾" flange. Estimated capacity—550 FPM on first layer of ¾" rope, line pull—5,000 to 6,000 lbs. with J. S. Mundy Co. quadrant control.

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½, ¾, 1", 2" and 3" pipe—new and reconditioned.

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Demolition Tools, Clay Diggers, Close Quarter Drills, Heavy Duty Drills, Sinker Drills, Riveters, Air Motors, Air Saws, Power Vane Drills, Multivane Drills and hammers, Weld Flux Chipper.

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Latest Schramm Models 20, 60, 105, 210, gas.
1—30KW gasoline powered generating plant
1—41B Bucyrus Erie caterpillar Steam Crane for pile driving
1—Model K Allis Chalmers Bulldozer

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Northwest Model 80-D 2½ yd Diesel shovel.
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12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
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1—315' Ing. Rand, Ser. 370-A-100, with Waukesha gas eng., 4 steel wheels. Good condition. $2,500.00.

3—210' Sullivan, Ser. Nos. 22115, 22277, 23203. Buda gas engine Mdl. JK-4, 4 cyl. Steel wheels. Special price $1850 each.

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1—Mdl. 501 Koehring #1071, 60-70-80' boom, 18' jib, Mdl. K Wisc. gas eng. Cap. 40,000# @ 12'. Shpg. wt. 97,200#. $12,000.00.

1—P&H 1½ yd. Mdl. 655-A, Ser. 6426. 85' boom. D13000 Cat Diesel eng. Wt. 82,900#. For rental only.

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1—50 HP Mundy 2/drum #15691, Nat'l. 2-spool attached swinger. 3/60/440 slipring motor. 7,000# @ 195 FPM. Wt. 12,000#. $4,000.

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1—Hough Model HM Payloader complete with 1½ cu. yd. 84" wide hydraulically operated bucket, four wheel drive, 14 x 24 pneumatic tires front and rear, gasoline powered. Ser. No. 90738. Placed new in rental service May of 1951. Current price f.o.b. factory $11,725.00. Our price R&G—$9,500.00.

1—Link Belt Speeder Model HC90 25-ton capacity Truck Crane, mounted on Link Belt Carrier equipped with high retractable gantry, lowering clutch on front drum, independent boom hoist, boom back stops; 90 ft. alloy steel main boom with hinges for folding and 30 ft. steel jib. Ser. No. 7AH-1176. Placed new in rental service December of 1948. Current price f.o.b. factory $36,275.00. Our price R&G—$30,500.00.

1—Link Belt Speeder Model HC70 20-ton capacity Truck Crane, mounted on Link Belt Carrier equipped with high retractable gantry, lowering clutch on front drum, independent boom hoist, boom back stops; 80 ft. alloy steel main boom with hinges for folding and 30 ft. steel jib. Ser. No. 8BH-682. Placed new in rental service August of 1948. Current price f.o.b. factory $29,955.00. Our price R&G—$23,500.

4—Lidgerwood High Speed Steel Erector Hoists, powered by 104 HP Chrysler Industrial engines, geared to lift 8000 lbs. at 290 FPM. Current price f.o.b. factory $6400.00 each. Our price R&G—$4000.00 each.

1—American Model 100 2G Hoist, powered by 104 HP Chrysler Industrial engine, geared to lift 8000 lbs. at 290 FPM. Ser. No. 20774. Placed new in rental service November of 1946. Current price f.o.b. factory $5200.00. Our price R&G—$3500.00.

1—American Model 100 2G Hoist, powered by 89 HP Minneapolis-Moline gasoline engine, geared to lift 10,000 lbs. at 210 FPM. Ser. No. 20849. Placed new in rental service January of 1947. Current price f.o.b. factory $5200.00. Our price R&G—$3500.00.

4—General Electric 200 HP motors, 900 RPM, Type MT561, 220 or 440 volt, Ser. Nos. 75249737, 75249739, 75249740 and 75249741, complete with suitable controls. Our price R&G—$3000.00 each.

1—Buda Gasoline Power Unit Model JH6, 1012A B/M #211507A, 6-cyl. 6" bore, 7½" stroke, piston displacement 1230 cu. in., Twin Disc Clutch, 4" shaft; brake horsepower @ 1000 RPM—136 HP. Current price f.o.b. factory $6033.70. Our price R&G—$3000.00.

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2—20-Ton Chisholm Moore Spur Gear Chain Hoists with 12 ft. lifts. Current price f.o.b. factory $1418.00 each. Our price R&G—$700.00 each.

1—Comet Senior Radial Saw with .5 HP 3-phase, 60 cycle, 220/440 volt electric motor, Ser. No. IG-2272. Our price R&G—$450.00.

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ELECTRIC LOCOMOTIVES, with extra batteries

3—Whitcombe, 10 Ton, 36" Gauge
6—Greenburgs, 11 Ton, 36" Gauge

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3—Eimco Rockershovels, Model 40
4—Conway-Muckers, Model 75

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38—5 Cu. Yd. Side Dump, 36" Gauge

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2—Roots-Connersville Blowers, 7300 c.f.m.
3—40 K. W. Battery Charging Units
2—20 K. W. Battery Charging Units
16—Ingersoll-Rand DA 35, wet type, Drifter Drills
24—Ingersoll-Rand S 70 Motor Feed Drifters
10—Ingersoll-Rand No. 229 DJB Drill Booms
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The following equipment is available for immediate sale on a where-is as-is basis, subject to prior sale. All equipment is available for inspection at location shown.

Tractor, Model D-8, Serial 1 H 9159. Includes: Model 25 Two Drum Power Control Unit, Serial 9D2918, Push Block, Roller Guards, Crank Case Guard. Location—Great Falls, Montana.

Scraper, Model W, Serial S-5873 WB. Dual 18:00 x 24 Tires, front and rear. Location—Great Falls, Montana.

Scraper, Model W, Serial S-5858 WB. Dual 18:00 x 24 Tires front and rear. Location—Great Falls, Montana.

Scraper, Model FP, Serial S-8111 FPSA. Single 18:00 x 24 Tires front; dual 18:00 x 24 Tires rear. Location—Great Falls, Montana.

Trenching Machine, Ladder Type Parsons #35, Serial 1384. Motor, Wisconsin Gasoline Model JK, Serial 268855. Location — Hungry Horse Government Camp, Montana.

Shovel, Northwest Model 20, Serial 4814-2779B. Motor, Wisconsin Gasoline Model L3, Serial 28869. Special Attachments: 30 Ft. Crane Boom, ⅝ Cu. Yd. Shovel front and bucket, ⅝ Cu. Yd. Backhoe. Location—Great Falls, Montana.

Plant, Concrete Paving, Koehring 21E. Location—Great Falls, Montana.

Sedan, 4 Door Cadillac, Model 46-62. Hydromatic Drive, Seat Covers, Radio, Heater. Location—Great Falls, Montana.

Trailer, Semi, Double Drop, 50 Ton Capacity, Olson, Serial 1083. Length 34'6", Outriggers, Hyster-Larison axel, eight 11:00 x 20 Tires. Location—Great Falls, Montana.

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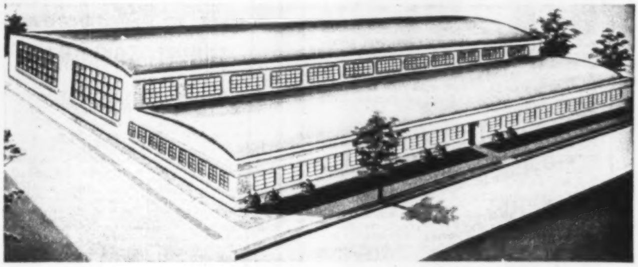

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232 pcs. 50 ft. Larssen III New—Florida
250 pcs. 39-35 ft. Carn. M-116—Tenn.
291 pcs. 30 ft. Beth. DP-2—New York
127 pcs. 25 ft. Carn. M-115—Missouri

Other lengths & sections used & new at other locations in United States for rent.

We have Nation-wide reputation for effecting QUICKEST SHIPMENTS

All sizes Vulcan & McKiernan Pile Hammers & Extractors for rent—Shop Rebuilt

Regardless of location of job, Wire, Write or Phone

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., Chestnut 4474 St. Louis, Mo.

STEEL SHEET PILING

FOR SALE

100 Ton of Z-Section Piling approx. 25 ft. lengths.

BASS ENGINEERING & CONSTRUCTION CO.
Birmingham Theatre Bldg.
Birmingham, Michigan

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155 pcs. Larssen I Steel Sheet Piling 48'
120 pcs. Larssen II Steel Sheet Piling 48'

Write Wire Phone

ATLANTIC PILING CORP.
47-29 Van Dam St., Long Island City 1, N. Y.
Exeter 2-1286

WANT BUY

ALL SECTIONS
STEEL SHEET PILING
PILE HAMMERS & EXTRACTORS

DARIEN CORP.
60 E. 42nd St. New York 17, New York

STOCK SPECIALS

For Sale or Rent

- 1—P & H Model 855 L. C., 2 yard Crawler Shovel-Crane, 100 ft. Boom, Diesel power, late model.
- 1—Bay City, Model 45, ¾ yd. Crawler Shovel, Hoe or Crane, Gas Power, practically new.
- 1—Bay City Model 42 ¾ yd. Crawler Shovel Hoe Crane. Excellent condition.
- 1—Marion 331 ¾ yd. Crawler Mounted Shovel Crane, gas power. Completely rebuilt.
- 1—P & H 255-A ¾ yd. Crawler Shovel, Hoe, Crane, Gas Power, Late Model.
- 1—Northwest, Model 25, ¾ yd. Crawler Shovel, gasoline power. Rebuilt.
- 1—Lorain, Model 40, ¾ yd. Crawler Crane and Hoe, gasoline power. Rebuilt.
- 1—Byers, Model 83, ¾ yd. Crawler Hoe or Crane, gasoline power. Rebuilt.
- 1—Bay City Model 25, ½ yd. gasoline Power Crawler Hoe, Crane, Shovel. Good Condition.
- 1—General, Heavy Duty, ½ yd. Crawler Shovel, Hoe or Crane, gasoline power. Rebuilt.
- 1—Insley Model K-12, ½ yd. 1947 Shovel & Hoe, on 18" Crawlers Powered by Buda Diesel Engine. Excellent Condition.
- 1—Bay City Model 20 ⅜ yd. Crawler Shovel-Hoe Gas Power, Good Condition.
- 2—Bay City Tractor Shovels, Hoes or Cranes, "Pups" ⅜ yd., ¾ swing, Crawler mounted, gasoline driven.
- 1—Lorain, Model 30 Truck Crane with 30 ft. Crane Boom and Shovel Attachment, mounted on A. C. Mack Chassis.
- 1—Bay City, Model 15, Truck Crane, 35 ft. boom, Hoe and Shovel, mounted on A. C. Mack Chassis.
- 2—Universal Truck Cranes, 28 ft. Booms, mounted on A. C. Mack Chassis. Cheap.
- 1—Lima Model 101 Crawler mtd. Crane, 60' Boom, Gas Power, Working Condition.
- Clamshell Buckets ⅜ to 2 cu. yd., also several Crane Booms—Trench Hoes and Shovel Attachments—Assorted makes.
- 3—Super C Tournapulls—3T Series.
- 11—Euclids—Bottom Dump, 9 FDT Series, 13 yd. struck capacity.
- 1—Euclid Model 7BV Loader (1949).

Check on what you may require.

EUGENE P. READING, INC.
Walnut St. & B. & O. R. R., Roselle, N. J.
Chestnut 5-0200—New Jersey

FOR SALE

(4) Super C Tournapulls .. Each	$7,000.00
DW10 Cat and Scraper	$6,500.00
(2) FDE Oliver Cletracs (Hyd. Blades) Each	$9,500.00
HD-10 Allis Chalmers (Hyd. Blade)	$4.000.00
Page Shovel Model 621S	
Page Shovel Model 625	
Caterpillar D6 (Hyd. Blade).....	$3,500.00
TD9 International (Hyd. Blade)	

HAZLETON MACHINERY & EQUIPMENT CO., INC.
R. D. #1 HAZLETON, PA.
Phone 3082

DIESEL GENERATOR SETS

A.C. UNITS

- **200 K.W.—G.M. 8-268A** Eight cylinder—6½" x 7"—1200 r.p.m.—440/3/60—with switchgear.
- **100 K.W.—G.M. 3-268A** Three cylinder—6½" x 7"—1200 r.p.m.—440/3/60—with switchgear.
- **30 K.W.—G.M. 3-71** Three cylinder—4½" x 5"—1200 r.p.m.—37.5 K.V.A.—220/440 volts—60 cycle—93 amps—4 wire—with panel board.
- **100 K.W. LORIMER** ENGINE: 150 HP—7½" x 9½"—five cylinder—4 cycle—720 r.p.m.—electric starting. GENERATOR: Allis-Chalmers—100 K.W.—440/3/60—80% P. F.—with switchgear.

D.C. UNITS

- **100 K.W. SUPERIOR GBD8** 5½" x 7" — 120/240 volts D.C.—417 amps.—with switchgear.

Other Sizes Available—Inquiries Invited

OTHER ITEMS

- **DEMING DEEP WELL PUMP** Turbine type — 900 G.P.M.—290 ft. head—6 stage—22 ft. column. DRIVE: Right angle—Johnson Gear Box.
- **STEEL MASTS** 5 available — 50' long — 30" diam. — ¾" stock. Can be used for underpinning.

WRITE—WIRE—PHONE

THE BOSTON METALS CO.
313 E. Baltimore St. CU 5050 Baltimore 2, Md.

STONE SPREADERS

Two Model SPS-2C Jaeger Stone Spreaders complete with steel crawlers and powered by F-266 Continental Engines, Serial No. 51x2025 and 51x2023. These machines are brand new and have never been used.

Please wire, write or call:

NELLO L. TEER COMPANY
Contract NOy-23453
U. S. Marine Air Base Cherry Point, N. C.

For Sale

IR JACKBITS—Type 1
Center Hole—Four Point
1½", 1⅝", 1¾"—2" 2¼" and 2⅜".
Priced under manufacturers selling prices.

JULIUS M. FOGELMAN
1649 Perkiomen Ave. Reading, Penna.

1943 R2 Caterpillar Tractor

With Hyster Winch — Recently rebuilt — $2,500.00—Phone Branford 8-1848

ALDEN S. HILL
Main Street, North Branford, Connecticut

FOR SALE

Adnum Pavers (converted to stone spreaders), machines in nearly new condition, spread to 12 ft. Location New Jersey.

Three Wheel 10 Ton Galion, Buffalo-Springfield and Huber rollers gas or diesel engine.

Tandem 10 to 12 Ton Galion rollers, gas or diesel.

Two LeTourneau Model L P Scrapers 1800 x 24 tires. Located Meadville, Pa.; Swedesboro, N. J.

Caterpillar No. 12 Patrol, 9K Series. Located Meadville, Pa.

D-7 Tractor, 3 T Series. Located Portville, N. Y.; Swedesboro, N. J.

S.J.GROVES
AND SONS COMPANY

19 Rector St., New York, N. Y.
WHitehall 3-1055

OFFICIAL PROPOSALS

(Continued from page 259)

Bids: March 6, 1952

Sanitary Sewerage Facilities

Sealed bids will be received by the Board of County Supervisors of Fairfax County, Virginia, at the Office of the Sanitary Engineer, County of Fairfax, VEPCO Building, Fairfax, Virginia, until 2:00 O'CLOCK P.M., E.S.T., THURSDAY, MARCH 6, 1952, for the installation of approximately 28,000 feet of 8" to 12" sanitary sewers, and appurtenant facilities, in Sanitary District No. 1, which has been designated as "Contract No. 10", and promptly thereafter they will be publicly opened and read in the Board of County Supervisors' Room, County Office Building, Fairfax, Virginia.

Plans, specifications and contract documents may be examined at the Office of Sanitary Engineer, and copies thereof may be obtained from Massey Engineers, Consulting Engineers, Ford Building, Fairfax, Virginia, upon payment of $15.00 in cash for each set, which sum will be refunded upon the return of such documents in good condition within ten (10) days after the bid date. Bids must be submitted on the forms supplied for this purpose and in strict accordance with the instructions therefor. Each bidder will be required to show evidence of possession of a certificate of registration as a contractor in the Commonwealth of Virginia before his bid will be considered.

Each bid must be accompanied by a bid bond or certified check made payable to the County of Fairfax, Virginia, in the amount of at least five per centum (5%) of the total amount of the bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price.

The time for completion of the contract is 180 consecutive calendar days and liquidated damages in the amount of $25.00 per day will be assessed in the event of delay or default in the completion of the contract.

No bid may be withdrawn for a period of thirty (30) days after the actual opening thereof, and the right is reserved to waive any informality therein and to reject any or all bids.

James J. Corbalis, Jr.
Sanitary Engineer
County of Fairfax
Fairfax, Virginia

READ THE OFFICIAL
PROPOSAL COLUMNS OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

USED MACHINERY VALUES

"Cat D-8, 8R-8105 LE TOURNEAU Angledozer and Cat # 25 DDPCU, Completely Reconditioned $12,000

#4 EUCLID Bottom Dumps, two 9FDT'S and two 25FDT'S CUMMINGS Engine, Good Rubber .... $9200 each

2 LE TOURNEAU FP Scrapers, Excellent Rubber .... $4500 each
INTERNATIONAL TD9, TDBC-16682,

B-E Angledozer and Carco Winch, Completely Remanufactured $6850

T. SOUTHWORTH
Tractor & Machinery Co., Inc.
Glenwood Road Menands, New York
Albany, New York—Telephone 5-5255
"CAT"

TRUSSES FOR SALE

42 wood, bowstring trusses, temporarily used for construction of heavy, 3 span, arch bridge, are now offered for sale. Trusses are finely fabricated, with laminated upper chords, complete with all bolts, ring connectors and steel gusset plates. Suitable for permanent use in auditorium, garage, school, etc. There are 14 trusses at 52 feet, 21 at 46 feet and 7 at 42 feet. Write or call

M & M CONSTRUCTION CO.
Bar Harbor, Maine

For Sale

3 drum JAEGER HOIST, 12000# linepull, with or without power.

J. C. THEILACKER CO.
5924 W. Washington Blvd., Milwaukee, Wis.

CRUSHERS: 48x42 Jaw; 10" McCully Reduction 16-B Telsmith; 48" Gyrasphere; 24x36 Jaw; 5½' Symons Cone. FEEDER 4'x18'. SCREENS. ROD MILL 8'x12' Marcy. BELT CONVEYORS. 880 Universal Junior Port. Gravelmaster. Misc. Contractors Equipment available at various locations in U. S. and Canada.

ALEX McLEOD MARIETTA, KANSAS

FOR SALE

Multifoote 34E Single Drum Paver
on cats with Boom and Bucket
Used Very Little - Fine Condition
$7000.00 (F.O.B. Frederick, Md.)

T. EDGIE RUSSELL Frederick, Md.

WANTED

WANTED TO BUY

1 H M Payloader 1½ cu yds.
2 Lowbed Trailers, capacity 35-40 tons. Rogers.
2 ¾ yd Rehandling buckets.
2 Lorain MC414 Truck Cranes.
4 15½ yd Dump Trailers.

PLEASE FURNISH ALL DETAILS.
PRICE—AGE—CONDITION

P. O. Box 9
Tonnelle Avenue North Bergen, N. J.

• WANTED •

3 DRUM HOIST & SWINGER

For Handling 1½ Yd. Clamshell
Diesel Power

W-3287, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

• WANTED •

STIFFLEG DERRICK & HOIST

100-ft. or longer Boom
Capacity 20-ton @ 100 ft. Radius
ALSO

3 DRUM ELECTRIC HOIST & SWINGER

100 H.P. or Larger—3-60-440

W-3288, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

• WANTED •

STIFFLEG DERRICK

10-Ton @ 100-Ft. Radius
For Clamshell Work

W-3289, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED

1—Model 50 Koehring Mud Jack—will rent or buy—quote best price and location for inspection.

MAHONEY-CLARKE, INC.
217 Pearl Street New York 38, N. Y.

WANTED

R. B. SUBGRADER, 20-25', with bridge, late model.

FEYEN CONSTRUCTION CO., Inc.
277 Burgess Street, Saint Paul 3, Minn.

FOR SALE

Miscellaneous Items of Construction Equipment

All Located in the Two Carolinas. Will rent with purchase options to qualified parties.

2—Koehring 34 E Dual Drum Pavers with GMC Diesel Engines
2—RB Power Subgraders 20′ to 25′
2—Blaw Knox Concrete Spreaders 20′—25′
1—Koehring Longitudinal Finisher 20′ to 25′
2—Blaw Knox Model XC Finisher 20′—25′
1—Butler 250 Barrel Bulk Cement Bin with batcher
1—Barber-Greene Asphalt Finisher
4000 Ft. Blaw Knox 9″ x 10″ Forms
5000 Ft. Heltzel 9″ Road Forms
Caterpillar D-6 with Traxcavator
Model 54 Wood Roadmixer
Lucey 104 Horse power Boiler
Cleaver Brooks 100 Horse power Boiler
Hopkins Low Pressure Burners with Electric motor
Forty Thousand Gallon bolted steel tank

BALLENGER PAVING COMPANY
P. O. Box 927
Greenville, South Carolina

FOR SALE

IMPORTED STEEL

HR—MILD—PRIME

ANGLES

1/2 x 1/2 x 1/8	— 20′
3/4 x 3/4 x 1/8	— 20′
1 x 1 x 1/8	— 20′
2 x 2 x 3/16	— 20′
2-3/16 x 2-3/16 x 1/4	— 20′
2-3/8 x 2-3/8 x 1/4	— 20′
3-1/2 x 3-1/2 x 3/8	— 20′
4 x 4 x 3/8	— 35′
6 x 4 x 7/16	— 40′

ROUNDS

3/8 x 30′ 9/16 x 30′ 15/16 x 30′

FOB Miami—Car—Truck
Pan Atlantic Steamship

FLORIDA STEEL SUPPLY CORP.
PO Box 486 Tel. 88-5222
Hialeah, Florida

DEPENDABLE! PRICED RIGHT!

IMMEDIATELY AVAILABLE

ADNUN BLACK TOP PAVER with electric screed heater. Rebuilt in our shop. Guaranteed; 6 cyl. Hercules gasoline engine. New rollers and 12″ screed extensions. **$8500.**

Two **SMITH 11-S CONCRETE MIXERS** on four pneumatic tires. Power loader, skip vibrator. 18-gal. water tank. Wisconsin model VE-4 gas engine. Rebuilt & Guaranteed. .... **Each $1825.**

INTERNATIONAL HARVESTER, Model I-6 Wheel type tractor with Baker bulldozer. Excellent condition. .... **$2750.**

Tel. for Inspection Appointment
CYpress 2-4800

H. O. PENN MACHINERY CO., INC.
140th St. & East River
New York 54, N. Y.

CLAMSHELL & ORANGE PEEL BUCKETS

Sizes: ⅝ to 2½ cu. yd. capacity.
Good used condition.

G. A. BASS Birmingham, Mich.

SURVEYING INSTRUMENTS

TRANSITS AND LEVELS

New or Rebuilt Sale or Rent

Headquarters for REPAIRS — any make — Factory Service. We will also *buy* your old instruments or *take* them in *trade*.

A complete line of Engineering Instruments and Equipment for field or office. Write for catalog N.R. 1-02.

WARREN-KNIGHT CO.
Manufacturers of Sterling Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

FROM STOCK

Brand New & Rebuilt

TRANSITS & LEVELS

Fully equipped modern shop—all makes and models repaired — all work guaranteed — instruments rented

Midwest Representative: W. & L. E. Gurley

NATIONAL BLUE PRINT CO.
Established 1914.
210 S. Canal St. Chicago (6), Ill.

SPECIALIZED REBUILDING

of surveying and engineering instruments
All makes and models expertly repaired in modern shop. All work guaranteed.

USED REBUILT INSTRUMENTS
for sale or rent

ROY D. HICKERSON
8 N EDMONDSON AVE. INDIANAPOLIS 19, IND.

Our Craftsmen do

INSTRUMENT REPAIR AND OVERHAUL

- Complete department—handles all makes.
- Experienced craftsmen do all work.
- Includes thorough overhaul, cleaning, oiling and adjustment.
- Precision work guaranteed.

DAVID WHITE COMPANY
317 W. Court St. • Milwaukee 12, Wis.

INSTRUMENTS FOR RENT

We rent transits and levels on a monthly or yearly basis. Reasonable rates. All instruments are fully guaranteed in first class working order.

DAVID WHITE COMPANY
317 W. Court St. • Milwaukee 12, Wis.

ALL MAKES

RE-BUILT
REPAIR BUFF
RENT
REAL EXPERTS

69 Dey St., New York

Immediate Delivery

"Caterpillar" D-4 w/dozer, clean.

"Caterpillar" D-4 w/Traxcavator A-1 condition.

Adams 414 Diesel motor patrol. A-1 condition.

1—Allis-Chalmers Model HD7W tractor w/Gar Wood bulldozer.

1—Allis-Chalmers Model B tractor with mower.

1—"Caterpillar" Model 212 motor grader.

1—Huber maintainer, good condition.

1—Gar Wood Model 508 scraper.

1—P & H Model WN300 portable welder.

1—Bros Model SG-55 skid mounted steam generator.

1—Allis-Chalmers HD7W and Gar Wood hyd. angle dozer.

1—Allis-Chalmers Model HD10W w/Baker Hydraulic Dozer.

LeTourneau 3½ cu. yd. scraper. Very clean.

1—Novo traffic line marker.

1—Titan chain saw.

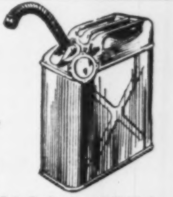
ILLINOIS ROAD EQUIPMENT CO.
1310 E. Jefferson St. Springfield, Ill.
Phone 2-7709

FOR SALE

DIPPER STICK AND BACKHOE ATTACHMENTS for ½ yard Michigan Machine.

C. FORSYTHE
127 Mt. Kemble Ave. Morristown, N. J.

BRAND NEW
U. S. ARMY
APPROVED



5 GALLON

JEEP CANS

Comp. With Spout

$3.50 EACH
F.O.B. Phila.

10 FOR $32.50 F.O.B. PHILA.

These cans are new and perfect, not to be confused with reconditioned or cheap imitations, same as used by U. S. Army. Ideal for equipment, car, truck, boat, etc., as spare gas can, also store water and oil.

15 INCH FLEXIBLE POURING SPOUTS
With Long Breather Tube and Flash Filter
Fits Above Jeep Can

50¢ EACH
F.O.B. PHILA.

J. JACOB SHANNON & CO.
214 N. 22nd St., Phila. 3, Pa.
The Oldest Equip. House in Phila.

SQUARE AND HEX HEAD

MACHINE BOLTS

LARGE QUANTITIES OF 5/8 AND LARGER DIAMETERS ARE BEING ADDED TO OUR STOCK FOR

Immediate Shipment

FAST SERVICE ON ANY QUANTITY—We stock fasteners of every type in all materials—Five warehouses to serve you.

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STRONGHOLD
SCREW PRODUCTS INC.
244 W. Hubbard St. • Chicago 10, Ill.
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STRONGHOLD SCREW PRODUCTS
CLEVELAND
NEW YORK
ATLANTA
DOWNEY (Los Angeles)

FOR SALE

Allis Chalmers Model HD-14c.
Serial No. 5714

Equipped with D. D. P. C. U. and angle blade. Reconditioned and guaranteed. Special price for quick sale.

International Model TD-24
Serial No. TDE-2913

Equipped with Bucyrus-Erie D. D. P. C. U. and Bulldozer. Purchased New April 1951. First Class Condition.

Dixie Construction Company
Phone 4-2252
Savannah, Georgia

For Sale

McKIERNAN-TERRY S-8 PILE HAMMER

With Leads
New 1951

THRUWAY CONSTRUCTORS
Port Byron, New York

METALWELD OFFERS

This is select equipment F.O.B. our Yard—Subject to prior disposition.

Worthington 315 cfm TS Hercules Diesel	$4500
Knickerbocker Mixer, 11S (Rebuilt) VF4 Wisc. Engine, 4 pneu. tires	$1500
Byers, ½ yd. comb. Clamshell and Shovel, Model 62, good condition	$6000

This AED Distributor, established over 30 years, has other reliable Used Equipment for sale or rent.

Send for list.

Metalweld INC.
2627 Hunting Park Avenue
RAdcliff 5-3471 PHILA., PA.

FOR SALE

- Lorain Model L50J, 1 yd. Shovel 60′ crane boom, crawler mounted. Less than 700 hrs.
- Lima 1¾ yd. Model 603 Crane Dragline, gasoline powered.
- Bucyrus Erie Model B Steam Crane
- Cletrac Tractor Model G with Sargeant overhead shovel.
- 40 ton Rogers low-bed trailer
- TD 14 Tractor with Bucyrus Erie hydraulic blade, new 1949, excellent condition.

M. H. HUBBARD
205 Peat Street, Syracuse 3, N. Y.
Phone 747723

FOR SALE

Wood Roadmixer, Model 48, S/N 105	$7,000
Wood Roadmixer, Model 54, S/N 134	$9,000
Allis Chalmers Motor Grader, Model AD-4, S/N AD-4-2116	$8,000
Rome Motor Grader, Model 404, S/N 404-941	$5,000
Seaman Pulvi-Mixer, S/N 72-39-1	$2,200

All First Class Condition

MATHY CONSTRUCTION CO.
508 Hoeschler Bldg. La Crosse, Wis.

RAILS

RAILS NEW AND RELAYING
TRACK ACCESSORIES
"FASTER FROM FOSTER"

Try us for all of your rail needs. We're buying daily — replenishing our stocks in all sizes. Complete stocks of All Track Tools & Accessories.

PIPE ✔ PILING ✔ WIRE ROPE & SLINGS

L. B. FOSTER co.
Pittsburgh 30, Pa. New York 7, N.Y.
Chicago 4, Ill. Houston 2, Tex.

RAILS *New and Relaying*

TRACK SUPPLIES STRUCTURAL STEEL RAILS

TRACK MATERIALS AND ACCESSORIES CARRIED IN STOCK

SWITCH MATERIAL • SPIKES & BOLTS • TRACK TOOLS • TIES • TIE PLATES • BUMPERS • COMPLETE SIDE TRACKS

BUILDERS STEEL SUPPLY CO.
4201 WYOMING • P.O. BOX 188 • DEARBORN, MICH.

BLACK-TOP PLANT
FOR SALE

This plant is complete with boiler and asphalt storage tanks.

Capable of running hot or cold mix on small or large tonnage, all electric driven 32-ft. Dryer and 2-ton Pug-mill.

Also for sale, 1 1250-gal.

ETNYRE ASPHALT DISTRIBUTOR mounted on EQ Mack equipment and truck new in 1950.

For details or inspection, write

P. O. BOX 227
HONESDALE, PENNSYLVANIA

FOR SALE

NORTHWEST 25 shovel & drag
NORTHWEST 6 shovel & drag
NORTHWEST 6 Backhoe
NORTHWEST 80-D shovel
NORTHWEST 95 Dragline
BUCYRUS ERIE 22-B shovel
BUCYRUS ERIE 54-B shovel & drag
BUCYRUS ERIE 120B dragline
BUCYRUS ERIE 170B shovel
MANITOWOC 3000 dragline
MANITOWOC 4500 dragline
EUCLID Rear Dump Trucks

FS-3170, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

FOR SALE

1—25 Ton Lorain Motor Crane MC 504 W Equipped with 85′ boom for crane, clam, & dragline. Used one year, like new. Located central Pennsylvania, & available immediately.

ALTOONA
CONSTRUCTION CORPORATION
516 Hart Street. Hollidaysburg, Pa.
Phone 5-0800

RAILS

EVERYTHING FOR THE TRACK FROM
SWITCH TO BUMPER

NEW & RELAY RAILS
IN STOCK
12# THRU 130# SECTIONS
ACCESSORIES & SWITCH MATERIALS
Inquiries Serviced Promptly

MORRISON RAILWAY SUPPLY CORP.
RAND BLDG. BUFFALO 3, N. Y.
EMPIRE BLDG. BIRMINGHAM 3, ALA.

NEW—RAILS—Relayers

All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mine equipment carried in stock.

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480 Lexington Ave.
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Park Bldg.
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IMMEDIATE SHIPMENT
RAILS NEW RELAYING
SWITCH MATERIAL
ALL TRACK ACCESSORIES
MIDWEST STEEL CORPORATION
CHARLESTON 21, W. VA.

For Rent

SPEEDCRANES

LATE MODELS

Manitowoc Diesel Powered Speedcranes for rent. 25, 40 and 60 ton capacities with booms 100' or more, 20' and 30' jibs. Special price on long rentals.

FORSYTHE EQUIPMENT CO., INC.
37-11 Vernon Blvd. Long Island City, New York
Tel. STillwell 4-1030

FOR RENT

802 LIMA CRANES & DRAGLINES
booms to 165 Ft.
372 MARION CRANES
booms to 165 Ft.
TRUCK CRANES 20 Ton Capacity
booms to 110 Ft.

FRANK BREEN
LUdlow 9-6016
1165 Longwood Ave., Bronx, N. Y.

FOR RENT

(1) 55-B and (1) 75-B Lorain shovel-cranes. Both are 1-C.Y. machines and are in first-class operating condition.

THOS. C. BROWN CO., INC.
307 Union St. Schenectady, N. Y.
Phone: 4-0814

FOR RENT • PUMPCRETE

New Rex Model 160 on 4 pneumatic tires with 1,000' 6" pipe and fittings.

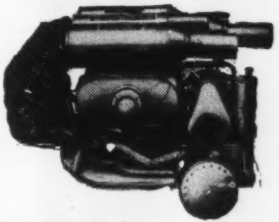
CURLY CONSTRUCTION CO., INC.
555 Cedar Lane Teaneck, New Jersey
Tel. TEaneck 6-7045

FOR SALE

1—Shovel 1½ cu. yd. Lorain 77 Diesel
1—Crane Lorain "77" Gas. with 1 yd. Bucket.
TD14 Bulldozer with Hydraulic Blade.

TEDESCO & ZANETTI CONT. CO.
NIGHT DAY
Astoria 8-3929 or Rav 8-1543. N. Y. C.

PORTABLE HEAT



100000 BTU Stewart Warner
1½ HP engine—Gov't. Surplus

Brand New $265.00
Completely Rebuilt $195.00

HARRIS MACHINERY COMPANY
501—30th Ave. S.E.
MINNEAPOLIS 14, MINN.

FOR SALE
Sand and Gravel Plant

Illinois Sand & Gravel Company plant located near Oswego, Illinois on CB&Q R.R., in operation until December 1, 1951. Offers to purchase may be made on entire plant, or on rails, screens, motors, equipment, etc., to

ILLINOIS SAND & GRAVEL CO.
Rm. 1509-343 S. Dearborn St.
Chicago 4, Illinois

We reserve the right to reject any and all offers.

FOR SALE
Four late model
EUCLID BOTTOM DUMP TRUCKS

13 cu. yd. capacity, excellent condition, location Winchester, Kentucky.

TALBOTT-MYERS CONSTRUCTION CORP.
Ph. 380 Winchester, Ky.

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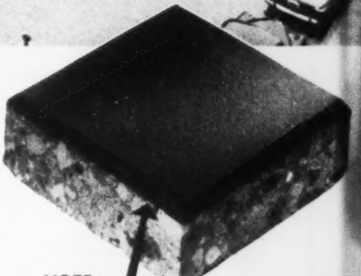

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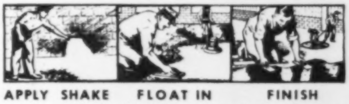

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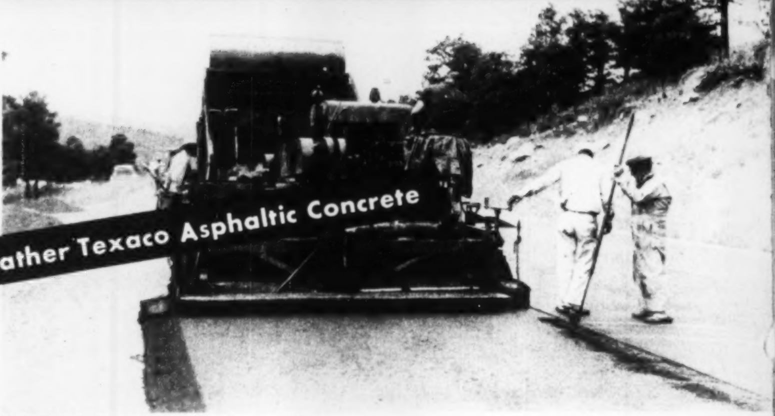
Where US-85 climbs over Raton Pass

elevation
7,830 feet

Hot-mix Texaco Asphaltic Concrete being laid on U. S. Route 85 over Raton Pass in New Mexico by Henry Thygensen and Company



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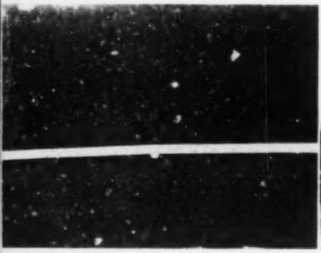
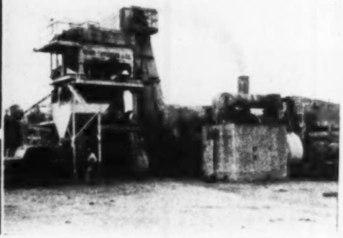
Compacting 3-inch stabilized leveling course, laid over pulverized old bituminous mat.

Home-made beveling attachment used on asphalt paving machine



Close-up of completed Texaco Asphaltic Concrete wearing surface.



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